2008 EASTON POINT RESIDENTIAL DEVELOPMENT

Rezoning
Master Plan
Precise Development Plan
Tentative Subdivision Map

Draft Environmental Impact Report

MARIN COUNTY

State Clearinghouse No. 2009012010

MARCH 2011
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1.0 INTRODUCTION
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The Martha Company has submitted an application to Marin County for the approval of the proposed 2008 Easton Point Residential Development Project (2008 Easton Point). The project site is approximately 110 acres located near the southeastern tip of the Tiburon peninsula. The proposed project involves the eventual subdivision of the 110 acres into 43 single family parcels (49.6 acres), two open space parcels (60.0 acres) and one Marin Municipal Water District water tank parcel (0.25 acres). The residential parcels would range in size from 0.55 acres to 2.25 acres. Access to the residential lots would be provided by two new roads/driveways off Paradise Drive (serving 13 homes) as well as extensions of existing roads including Mountain View Drive (serving three homes) and Ridge Road (serving 27 homes). Proposed open space and public access improvements include the creation of approximately 60 acres of dedicated public open space, including a Marin dwarf flax preservation area (0.3 acres) and access easements to provide pedestrian access through the project site to proposed and existing public open space areas.

The application has been filed with Marin County in reliance on a U.S. District Court decision resulting from a 1975 lawsuit which determined that development of the project site with a minimum of 43 single-family residential units on minimum one-half acre lots would be consistent with the goals of the Marin Countywide Plan. 1

The applicant requests approval by Marin County of the following:

- Easton Point Master Plan
- Precise Development Plan (Phase One)
- Tentative Subdivision Map
- Rezoning Request
- Exception to Marin County Subdivision Standards (an exception is requested to Title 24, Development Standards, Section 24.04.110[width])

The project site is within the Town of Tiburon’s Urban Service Area and Sphere of Influence. It is not, however, proposed to annex the project site to the Town of Tiburon. The applicant will, however, apply for annexation to Sanitary District No. 5.

Two previous EIRs have been prepared for development proposals on the project site. In 1996, under contract to the Town of Tiburon, Nichols • Berman prepared a Draft EIR (1996 Draft EIR) for the proposed Easton Point project. 2 The 125-acre site, which was considered in the 1996 Draft EIR, consisted of two parcels bisected by Paradise Drive. The two parcels were the 110-acre Upland Parcel and the 15-acre Shoreside Parcel located along the shoreline of San Francisco Bay on the east side of the Bluff Point peninsula, east of Paradise Drive. The project applicant proposed to create 49 lots for

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1 Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, filed November 7, 2007 in County of Marin v. Martha Co. et al (Judgment) and Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, files December 29, 1976 in Martha Co. v. County of Marin (1976 Judgment).

development of single-family homes – 44 lots on the Upland Parcel and five lots on the Shoreside Parcel. The 1996 EIR was not certified by the Town of Tiburon.

In 2001, under contract to the Town of Tiburon, Nichols • Berman prepared a Draft EIR (2001 Draft EIR) for a revised Easton Point project. 3 The revised project proposed the development of 34 single-family residential lots on the 110-acre Upland Parcel. The 15-acre Shoreside Parcel was not included in the revised Easton Point project. 4 The 2001 EIR was not certified by the Town of Tiburon.

The 110-acre Upland Parcel evaluated in the 1996 and 2001 Draft EIRs is the project site for the current proposed Easton Point project.

This Draft Environmental Impact Report (Draft EIR) describes the potential environmental effects that could result from implementation of the proposed 2008 Easton Point Residential Development project (the proposed project).

On November 12, 2009 the Town of Tiburon and the Easton Point project applicant (the Martha Company) signed a Memorandum of Understanding (MOU) regarding a 32-Unit Lower Density Alternative (LDA) for the project site. As a part of the MOU it has been requested that Marin County evaluate, at a project level of detail, the LDA as a project alternative in this Draft EIR. The LDA, therefore, is evaluated in Chapter 6.0 Alternatives to the Proposed Project.

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

1.1 EIR REQUIREMENT

Environmental review in compliance with the California Environmental Quality Act (CEQA) is required as part of Marin County’s consideration of the 2008 Easton Point project. After reviewing the proposal, the application was deemed complete on May 28, 2009. On the basis of the completed application, County staff members determined that an EIR covering the following topics should be prepared:

- Conformance with Public Plans
- Transportation
- Air Quality
- Biological Resources
- Geology and Soils
- Public Services

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4 The 15-acre Shoreside Parcel is in a different ownership.
In accordance with the State CEQA Guidelines, no Initial Study was prepared since the preliminary review determined that an EIR would be required. While no Initial Study was prepared by Marin County for this EIR effort, an Initial Study was prepared in May 2000 for the 2001 Draft EIR. The 2000 Initial Study was reviewed while preparing the scope of this Draft EIR.

In compliance with CEQA, Marin County sent a Notice of Preparation (NOP) on January 9, 2009 to government agencies, special service districts, organizations, and individuals with an interest in or jurisdiction over the project. This step ensured early consultation with these entities on the scope of the EIR.

On January 29, 2009 Marin County conducted a public scoping session on the proposed project. The purpose of the meeting was to identify environmental issues and concerns of the public about the project in order to evaluate those issues in this EIR.

A list of individuals and agencies responding to the NOP is provided in the appendix. Responses to the NOP and scoping meeting comments are part of the public record for the project. They are on file and available for public review during normal business hours at the Marin County Community Development Agency, 3501 Civic Center Drive, Room 308 San Rafael, CA 94903 as are other environmental and planning documents compiled for the project.

The Draft EIR has been prepared in accordance with the California Environmental Quality Act, including the CEQA Statutes (Public Resources Code §§ 21000-21178.1), State CEQA Guidelines (Code of Regulations, Title 14, §§ 15000-15387), the Marin County Environmental Impact Review Guidelines and relevant court decisions.

1.2 EIR OBJECTIVITY

In accordance with CEQA, this EIR:

- Assesses the expected impacts of the ultimate environmental changes resulting from implementation of the proposed 2008 Easton Point project;
- Identifies mitigation measures that could avoid or minimize potentially significant environmental impacts; and
- Evaluates alternatives to the proposed project.

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

- Changes or alterations have been required in, or incorporated into, the project which avoid or substantially reduce the significant impacts identified in the EIR;
- Such changes or alterations are within the responsibility and jurisdiction of another public agency, and such changes have been adopted by such other agency or can and should be adopted by such other agency; or
• Specific economic, legal, social, technological, or other considerations make the mitigation measures of the EIR or project alternative(s) infeasible.

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

The EIR is a factual, objective, public-disclosure document that takes no position on the merits of the project, but rather provides information by which decisions about the project can be based. The EIR has been prepared according to the professional standards and practices of the EIR consultants’ individual disciplines and in conformance with the legal requirements and informational expectations of CEQA and the State and local guidelines in place to implement it. EIR authors are listed in Chapter 8.0 Report Preparation and Persons Consulted.

1.3 PUBLIC REVIEW AND COMMENT

Marin County will circulate this Draft EIR widely for review and comment by public agencies, interested individuals, and organizations and will accept comments in writing. Comments should address the adequacy and completeness of the Draft EIR or contain questions about the environmental consequences of approving and implementing the project, not on the merits of the project itself (the County will invite comments on the project itself as part of its normal public review process, separate from considering the Draft EIR). Adequacy refers to the EIR's completeness in disclosing significant environmental effects, identifying measures to mitigate those significant impacts, and providing sufficient information for officials to make decisions about the merits of the project. The State CEQA Guidelines direct that an EIR focus on a project's significant environmental impacts and not to dwell on all conceivable less-than-significant effects, so that reports can be succinct disclosure documents and effective decision-making tools.

Written comments on the Draft EIR must be made before the close of the public review period and mailed to or delivered to the following address:

Curtis Havel  
Marin County Community Development Agency  
3501 Civic Center Drive, Room 308  
San Rafael, CA 94903

Comments can be sent by email to Curtis Havel at chavel@co.marin.ca.us

A Final EIR will be prepared after the close of the public review period. The Final EIR will include all comments received by the County during the public review period and responses to those comments. The Final EIR will be distributed to the public and to public agencies commenting on the Draft EIR for review before the County considers certifying the Final EIR as complete.

No action can be taken to approve or conditionally approve the project until the Final EIR is certified. County acceptance of the EIR upon certification does not require approval of the project studied in the EIR.

In addition to preparation of the Final EIR, a Mitigation Monitoring and Reporting Program (MMRP) will be prepared. California State Government Code Section 21081.6 (California Environmental
Quality Act) requires a public agency to adopt a reporting or monitoring program when approving a project or changes to a project, in order to mitigate or avoid significant effects on the environment. The program is based on the findings and the required mitigation measures presented in the EIR that has been prepared on the project and certified by the lead agency. The reporting or monitoring program must be designed to ensure compliance during project implementation.

As per the State CEQA Guidelines, the MMRP must:

- Identify the entity that is responsible for each monitoring and reporting task, be it Marin County (as Lead Agency), other agency (Responsible or Trustee Agency), or a private entity (i.e., the project sponsor);

- Be based on the project description and the required mitigation measures presented in the environmental document prepared for the project and certified by the Lead Agency;

- Be approved by the Lead Agency at the same time of project entitlement action or approvals.

### 1.4 REPORT ORGANIZATION

After Chapter 1.0 Introduction, the Draft EIR is organized as follows:

- **Chapter 2.0 – Summary of Findings**, identifies areas of controversy, highlights the important effects of implementing the project, and identifies some of the measures available to mitigate significant adverse impacts.

- **Chapter 3.0 – Description of the Proposed Project**, describes the location of the project site, existing land uses on and in the vicinity of the project site, all aspects of the project as proposed, cumulative assumptions used throughout the analyses, and the approvals and permits required before the project could be implemented, if approved.

- **Chapter 4.0 – Relationship to Public Plans**, presents an analysis of the project in relation to the adopted Marin Countywide Plan, Marin County Development Code (Zoning Ordinance), Marin County Single Family Residential Design Guidelines, Marin County Community Development Agency Paradise Drive Visioning Plan, and Marin Local Agency Formation Commission (LAFCo) Policy Guidelines.

- **Chapter 5.0 – Environmental Setting, Impacts, and Mitigation Measures**, describes existing environmental conditions on the site and within the study area, identifies probable impacts from implementing the project, and describes mitigation measures required to substantially reduce or eliminate potentially significant adverse impacts.

- **Chapter 6.0 – Alternatives to the Proposed Project**, describes and assesses the difference in outcome between the project and four alternatives: a No Project alternative; and three on-site alternatives. One of the alternatives is a 32-Unit Lower Density Alternative prepared by the project applicant and the Town of Tiburon. This chapter also identifies an environmentally superior alternative among the alternatives.

- **Chapter 7.0 – Impact Overview**, discusses growth inducing impacts and cumulative impacts, significant unavoidable impacts, and effects of no significance.
• Chapter 8.0 – Report Preparation and Persons Consulted includes: the report preparers; the people and organizations consulted; and the bibliography.

• Appendix includes technical background material supporting the Draft EIR text.

1.5 INFORMATION USED TO PREPARE THE DRAFT EIR

The State CEQA Guidelines permit any person, including the applicant, to submit information to assist in the preparation of an EIR but require independent review of the information to ensure that it accurately reflects the Lead Agency's judgment about the environmental impacts of the project. The Draft EIR consultants conducted peer reviews of the background reports and documents submitted to the County as part of the project application. Applicant-prepared information was only used in the Draft EIR after the validity of the data was verified and, where required, updated by the EIR consultants. Documents prepared by the applicant's consultants and examined in the Draft EIR's environmental analyses are listed below, identified in the relevant report sections, and referenced in Chapter 8.0 Report Preparation and Persons Consulted.

• Easton Point – Project Narrative, project applicant, 2008, Revision 2 in Response to Comments. Received by Marin County CDA 3-30-2009.

This is a discussion of the proposed project submitted as a part of the project application. Information regarding the proposed project, the planning land use context, the master plan, the precise development plan, and the tentative map is provided.

• Architectural and Landscape Design Guidelines for Easton Point, 2008.

This document provides architectural design guidelines plus landscape design guidelines for the proposed project. This document is Exhibit D in the Project Narrative.

• Environmental Assessment, 2008.

This document discusses potential environmental impacts of the proposed project. Project design measures to avoid or reduce impacts to less-than-significant plus project benefits are also discussed. This document is Exhibit E in the Project Narrative.

• Construction Management Plan, 2008.

This document describes the applicant related construction activities and proposed mitigation measures for construction impacts. This document is Exhibit F in the Project Narrative.


This report presents the results of a preliminary geotechnical investigation performed on the project site by Miller Pacific Engineering Group. Preliminary geotechnical recommendations and design criteria for use in project planning are presented.

• Landslide Criteria and Mitigation Policy, Easton Point Development Tiburon, California, Miller Pacific Engineering Group, December 7, 2010.
This letter report summarizes the landslide criteria used and the recommended conceptual stabilization plan for the proposed project.

- Supplemental Groundwater Investigation for Easton Point Subdivision Tiburon, California, Questa Engineering Corporation, November 4, 2008. An addendum was prepared by Questa Engineering Corporation and is dated April 16, 2009.

This report presents the results of Questa’s investigation of hydrogeology and groundwater conditions at the project site. The study was undertaken to provide additional detail regarding the existing groundwater conditions and potential changes that could result from the proposed project.


This report is an update of the Tree and Rock Outcrop Survey Point Description Listing prepared for the project site in 1999. The 1999 report was based on a 1995 field survey which identified the location, species, and sizes of the trees in various locations throughout the project site. The updated tree report was prepared for the purpose of providing an overview and update of the existing trees’ size and health to determine the impact on trees with implementation of the proposed project.

- Lot Specific Conceptual Grading Plans, 43 sheets (G-1 to G-43), January 2009.

A conceptual grading plan has been prepared for each of the 43 proposed lots. The grading plans are based on the building footprints shown on the Master Plan Site Plan.

- Lot Specific Tree Removal Exhibits, 18 sheets, November 2008.

An estimate of the number of trees to be removed from each proposed lot has been prepared. Trees to be removed as part of the fire defensible space plan and due to tentative map improvements are identified.

- Easton Point Master Plan / Precise Development Plan / Tentative Map, revised January 2009.

This submittal includes the exhibits submitted as a part of the Master Plan / Precise Development Plan / Tentative Map and includes the following sections:

  Resource Conservation Exhibits – This section consists of eight sheets (R-1 – R-8) and provides information on existing topography, geology, biology, slopes, and on-site trees and rocks.

  Civil Exhibits – This section consists of 13 sheets (C-1 – C-11) and provides information on proposed site grading, erosion control, utilities, a loting plan, an easement plan, road profiles, and a circulation plan.

  Architectural Exhibits – This section consists of four sheets (A-1 – A-4) and provides an architectural site plan, site sections, typical houses and typical schematic sections.

  Landscape Exhibits – This section consists of three sheets (L-1 – L-3) and provides a landscape site plan plus two typical lot landscape plans.
• **Drainage Report Onsite Drainage Hydrology and Hydraulics for Easton Point Master Plan, Precise Plan, Tentative Map Marin County, California, Land Development Solutions, Inc., January 29, 2009.**

This report provides the methodology and calculations for the Storm Drainage elements of the Easton Point Master Plan, Precise Plan, and Tentative Map.

• **Focused Traffic Study for the Martha Company Project, W-Trans, March 17, 2009.**

Issues addressed in this report include off-site improvements to meet Marin County Code requirements, a sight distance evaluation and need for a left-turn pocket on Paradise Drive at proposed access locations. Bicycle and pedestrian improvements needed to meet requirements of the County’s Bicycle and Pedestrian Master Plan are also discussed.

• **Comparison of Published Road Standards and Proposed Road Design, W-Trans, April 2, 2009.**

This report provides a review and comparison of various road standards including Marin County and the proposed private road standards for the proposed project.

These documents are available for public review at

Marin County Community Development Agency  
3501 Civic Center Drive, Room 308  
San Rafael, CA 94903

**1.6 GLOSSARY AND ACRONYMS**

A glossary of terms used in this document is provided in **Exhibit 1.0-1**. Acronyms used in this document are listed in **Exhibit 1.0-2**.
### Exhibit 1.0-1

#### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acre-foot of water</td>
<td>One acre-foot of water is equal to 325,829 gallons of water. This measurement refers to the amount of water covering one acre to a depth of one foot.</td>
</tr>
<tr>
<td>Bikeways</td>
<td>Caltrans standards provide for three types of bikeway facilities, as described below:</td>
</tr>
<tr>
<td></td>
<td>Class I Bikeway (Bicycle Path) - provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.</td>
</tr>
<tr>
<td></td>
<td>Class II Bikeway (Bicycle Lane) - provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five feet wide. Adjacent vehicle parking and vehicle / pedestrian cross-flow are permitted.</td>
</tr>
<tr>
<td></td>
<td>Class III Bikeway (Bicycle Route) - provides for a right-of-way designated by signs or pavement markings for shared use with motor vehicles</td>
</tr>
<tr>
<td>Cistern</td>
<td>A receptacle for holding water or other liquid, especially a tank for catching and storing rainwater.</td>
</tr>
<tr>
<td>Compacted Fill Buttress</td>
<td>A compacted fill mass that is constructed against a slope for the purpose of stabilizing adverse geologic conditions.</td>
</tr>
<tr>
<td>Conditions, Covenants and Restrictions</td>
<td>Conditions, covenants, and restrictions (CC&amp;Rs) are limitations and rules placed on a group of homes by a builder, developer, neighborhood association and / or homeowner association. All condos and townhomes have CC&amp;Rs; however, so do most planned unit developments and established neighborhoods.</td>
</tr>
<tr>
<td>Debris Fence</td>
<td>A fence structure placed within a ravine or swale that is designed to catch and slow down soil and rock debris from debris flows and erosion.</td>
</tr>
<tr>
<td>Defensible Space</td>
<td>Fire safe zones around structures facilitated by both fuel modification (pruning) and reduction (removal of pyrophytes).</td>
</tr>
<tr>
<td>Ephemeral Stream</td>
<td>A watercourse that carries only surface runoff and flows during and immediately after periods of precipitation.</td>
</tr>
<tr>
<td>Fire Flow</td>
<td>The term firefighters use to describe how much water can be delivered by a water system through one or more hydrants to fight a fire at a specific location or to state the optimum amount (standard) of water flow firefighters require for a theoretical fire at a specific location. The former is determined by a pipe's size, pressure and internal condition and the latter is based on standards developed over years of experience.</td>
</tr>
<tr>
<td>Flood, 100-year</td>
<td>Based on historical data, the magnitude of a flood expected to occur</td>
</tr>
</tbody>
</table>
**Term** | **Meaning**
--- | ---

on the average every 100 years. The 100-year flood has a one percent chance of occurring in any given year.  

Green Building | Generally refers to a whole-systems approach to building design, construction, and occupancy. Site, energy, water, resources, materials, indoor air quality, and financial feasibility are all analyzed for environmental impact, health effects, and cost effectiveness.  

Level of Service (LOS) | LOS is a qualitative assessment of perceived traffic conditions by motorists and it generally reflects driving conditions such as travel time and speed, freedom to maneuver, and traffic interruptions. LOS uses quantifiable traffic measures such as average speed, intersection control delay, and volume-to-capacity ratio to determine driver satisfaction. Reported for individual intersections, LOS is designated by a range of letters, with “A” representing the most favorable conditions (free flow) and “F” representing the least favorable conditions (jammed with excessive delays).  

Low-Impact Development | Low impact development is an innovative storm water management approach with the basic principle that is modeled after nature: manage runoff from rainfall and urban use of water at the source using uniformly distributed decentralized micro-scale controls.  

Peak Hour | The 60-minute period in the morning (AM) and in the evening (PM) with the highest volume of motor vehicle traffic constitutes the “peak hour” for the purposes of the traffic analysis.  

Planning Area | The Tiburon Planning Area consists of the incorporated Town of Tiburon, the unincorporated part of Paradise Drive, the unincorporated area between the western border of incorporated Tiburon and U.S. 101 north of Tiburon Boulevard, and all unincorporated portions of the Ring Mountain Open Space Preserve.  

Property Owners’ Association | A property (or home) owner’s association is an organization created by a real estate developer for the purpose of developing, managing and selling a development of homes. It allows the developer to exit financial and legal responsibility of the community, typically by transferring ownership of the association to the homeowners after selling off a predetermined number of lots. It allows the local government to increase its tax base, but reduce the amount of services it would ordinarily have to provide to non-homeowner association developments.  

Building Site | Each residential lot includes a building site where the majority of development would occur. Development of each main housing unit would be restricted to within the residential use area.  

Ridgeline | As used in the Marin Countywide Plan, a line connecting the highest points along a ridge and separating drainage basins or small-scale drainage systems from one another.

Notes: see Exhibit 5.3-1 for definitions of acoustical terms.
### Exhibit 1.0-2
#### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
</tr>
<tr>
<td>AB</td>
<td>Assembly Bill</td>
</tr>
<tr>
<td>ADT</td>
<td>average daily traffic</td>
</tr>
<tr>
<td>APN</td>
<td>Assessor’s parcel number</td>
</tr>
<tr>
<td>ATCM</td>
<td>Airborne Toxic Control Measure</td>
</tr>
<tr>
<td>BAAQMD</td>
<td>Bay Area Air Quality Management District</td>
</tr>
<tr>
<td>BMP</td>
<td>Best Management Practice</td>
</tr>
<tr>
<td>Caltrans</td>
<td>California Department of Transportation</td>
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<tr>
<td>CAPCOA</td>
<td>California Air Pollution Control Officers Association</td>
</tr>
<tr>
<td>CARB</td>
<td>California Air Resources Board</td>
</tr>
<tr>
<td>CBC</td>
<td>2007 California Building Code</td>
</tr>
<tr>
<td>CCP</td>
<td>Cities for Climate Protection Campaign</td>
</tr>
<tr>
<td>CC&amp;Rs</td>
<td>covenants, conditions, and restrictions</td>
</tr>
<tr>
<td>CDA</td>
<td>Marin Community Development Agency</td>
</tr>
<tr>
<td>CDMG</td>
<td>California Division of Mines and Geology</td>
</tr>
<tr>
<td>CEC</td>
<td>California Energy Commission</td>
</tr>
<tr>
<td>CEQA</td>
<td>California Environmental Quality Act</td>
</tr>
<tr>
<td>CFCs</td>
<td>chlorofluorocarbons</td>
</tr>
<tr>
<td>CFS</td>
<td>Cubic Feet per Second</td>
</tr>
<tr>
<td>CHP</td>
<td>California Highway Patrol</td>
</tr>
<tr>
<td>CMP</td>
<td>Marin County Congestion Management Program</td>
</tr>
<tr>
<td>CNDDDB</td>
<td>California Natural Diversity Data Base</td>
</tr>
<tr>
<td>CNPS</td>
<td>California Native Plant Society</td>
</tr>
<tr>
<td>CNEL</td>
<td>Community noise equivalent level</td>
</tr>
<tr>
<td>CO₂</td>
<td>carbon dioxide</td>
</tr>
<tr>
<td>Corps</td>
<td>U.S. Army Corps of Engineers</td>
</tr>
<tr>
<td>CRLF</td>
<td>California red-legged frog</td>
</tr>
<tr>
<td>CWP</td>
<td>The Marin Countywide Plan</td>
</tr>
<tr>
<td>CO₂e</td>
<td>Equivalent CO₂ Emissions</td>
</tr>
<tr>
<td>CWPP</td>
<td>Marin County Community Wildlife Protection Plan</td>
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<tr>
<td>Acronym</td>
<td>Meaning</td>
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<td>---------</td>
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<tr>
<td>dB</td>
<td>Decibel</td>
</tr>
<tr>
<td>dBA</td>
<td>A-weighted sound</td>
</tr>
<tr>
<td>DBH</td>
<td>Diameter at Breast Height</td>
</tr>
<tr>
<td>DPM</td>
<td>Diesel particulate matter</td>
</tr>
<tr>
<td>EIR</td>
<td>Environmental impact report</td>
</tr>
<tr>
<td>EFZ</td>
<td>Alquist-Priolo earthquake fault zone</td>
</tr>
<tr>
<td>EPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>FAR</td>
<td>floor area ratio</td>
</tr>
<tr>
<td>FEMA</td>
<td>Federal Emergency Management Agency</td>
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<tr>
<td>FIRM</td>
<td>Flood Insurance Rate Map</td>
</tr>
<tr>
<td>gpd</td>
<td>gallons per day</td>
</tr>
<tr>
<td>gpm</td>
<td>gallons per minute</td>
</tr>
<tr>
<td>GHAD</td>
<td>Geologic Hazard Abatement District</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse gases</td>
</tr>
<tr>
<td>GWP</td>
<td>Global Warming Potential</td>
</tr>
<tr>
<td>HCFCs</td>
<td>hydro chlorofluorocarbons</td>
</tr>
<tr>
<td>HCM</td>
<td>Highway Capacity Manual</td>
</tr>
<tr>
<td>HOA</td>
<td>Homeowners Association</td>
</tr>
<tr>
<td>ICLEI</td>
<td>International Council for Local Environmental Initiatives</td>
</tr>
<tr>
<td>IPCC</td>
<td>United Nations Intergovernmental Panel on Climate Change</td>
</tr>
<tr>
<td>kWh</td>
<td>kilowatt hours</td>
</tr>
<tr>
<td>$L_{dn}$</td>
<td>Day / night noise level</td>
</tr>
<tr>
<td>$L_{eq}$</td>
<td>Energy equivalent noise level</td>
</tr>
<tr>
<td>LAFCo</td>
<td>Local Agency Formation Commission</td>
</tr>
<tr>
<td>LCFS</td>
<td>Low carbon fuel standard</td>
</tr>
<tr>
<td>LID</td>
<td>Low-impact development</td>
</tr>
<tr>
<td>LOS</td>
<td>Level of Service</td>
</tr>
<tr>
<td>MCC</td>
<td>Marin County Code</td>
</tr>
<tr>
<td>MCOSD</td>
<td>Marin County Open Space District</td>
</tr>
<tr>
<td>MCSTOPP</td>
<td>Marin County Stormwater Pollution Prevention Program</td>
</tr>
<tr>
<td>mcy</td>
<td>million cubic yards</td>
</tr>
<tr>
<td>MEP</td>
<td>Maximum Extent Practicable</td>
</tr>
<tr>
<td>MERA</td>
<td>Marin Emergency Radio Authority</td>
</tr>
<tr>
<td>mgd</td>
<td>million gallons daily</td>
</tr>
<tr>
<td>MMRP</td>
<td>Mitigation Monitoring and Reporting Program</td>
</tr>
<tr>
<td><strong>Acronym</strong></td>
<td><strong>Meaning</strong></td>
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<td>--------------</td>
<td>-------------------------------------------------------------------</td>
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<tr>
<td>MMTCO2e</td>
<td>Million metric tons of equivalent CO2 emissions</td>
</tr>
<tr>
<td>MMWD</td>
<td>Marin Municipal Water District</td>
</tr>
<tr>
<td>MPG</td>
<td>Miles per gallon</td>
</tr>
<tr>
<td>mph</td>
<td>Miles per hour</td>
</tr>
<tr>
<td>MTC</td>
<td>Metropolitan Transportation Commission</td>
</tr>
<tr>
<td>MUTCD</td>
<td>2003 <em>Manual on Uniform Traffic Control Devices</em></td>
</tr>
<tr>
<td>MVRS</td>
<td>Mill Valley Refuse Service</td>
</tr>
<tr>
<td>NOI</td>
<td>Notice of Intent</td>
</tr>
<tr>
<td>NOP</td>
<td>Notice of Preparation</td>
</tr>
<tr>
<td>NPDES</td>
<td>National Pollutant Elimination System</td>
</tr>
<tr>
<td>NWIC</td>
<td>Northwest Information Center of the California Historical Resources Information System at Sonoma State University</td>
</tr>
<tr>
<td>OPR</td>
<td>Governor’s Office of Planning and Research</td>
</tr>
<tr>
<td>PAHs</td>
<td>Polycyclic Aromatic Hydrocarbons</td>
</tr>
<tr>
<td>PDP</td>
<td>Precise Development Plan</td>
</tr>
<tr>
<td>PD-R</td>
<td>Planned Development - Residential</td>
</tr>
<tr>
<td>PG&amp;E</td>
<td>Pacific Gas &amp; Electric Company</td>
</tr>
<tr>
<td>PR</td>
<td>Planned Residential</td>
</tr>
<tr>
<td>POA</td>
<td>Property Owners’ Association</td>
</tr>
<tr>
<td>psi</td>
<td>pounds per square inch</td>
</tr>
<tr>
<td>RCP</td>
<td>Reinforced concrete pipe</td>
</tr>
<tr>
<td>RPD</td>
<td>Residential Planned Development</td>
</tr>
<tr>
<td>RMP</td>
<td>Resource Management Plan</td>
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<tr>
<td>RMP-0.2</td>
<td>Residential, Multiple Planned, 0.2 units per acre</td>
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<td>Meaning</td>
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<td>SODS</td>
<td>Sudden Oak Death Syndrome</td>
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<td>SM4</td>
<td>Small Municipal Separate Storm Sewer Systems</td>
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<td>Water Transit Authority</td>
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<tr>
<td>WUI</td>
<td>wildland-urban interface</td>
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</table>
2.0 SUMMARY OF FINDINGS
2.0 SUMMARY OF FINDINGS

This chapter summarizes the proposed project considered in this draft Environmental Impact Report (Draft EIR); including environmental impacts associated with the proposed project and mitigation measures.

2.1 PROPOSED PROJECT

The 110-acre 2008 Easton Point Residential Development project site (APN 59-251-05) is located at the southeastern tip of the Tiburon Peninsula in unincorporated Marin County, about five miles southeast of the U.S. Highway 101 (U.S. 101) / Tiburon Boulevard interchange via Tiburon Boulevard and about eight miles from the U.S. 101 / Tamalpais Drive interchange via Paradise Drive. The site is contiguous to the Town of Tiburon’s corporate boundary on the south and west where it also is adjacent to the Old Tiburon and Hill Haven residential neighborhoods (south), Old St. Hilary’s Open Space Preserve and Tiburon Uplands Nature Preserve (west), and Paradise Drive (north and east).

One of the applicant’s objectives of the proposed project is to develop residential development consistent with the Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, filed November 7, 2007, in County of Marin v. Martha Co. et al. as well as the Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, filed December 29, 1976 in Martha Co. v. County of Marin.

The applicant proposes to create 43 residential lots for development of single family homes (49.61 acres). In addition two parcels (Parcel A 59.60 acres and Parcel B 0.33 acres) would be offered for dedication to the Marin County Open Space District. Parcel B is proposed as a Marin dwarf flax (a special status plant species) preserve. A 180,000-gallon concrete water tank would be constructed on Parcel C (0.25 acres). The applicant proposes to construct roads and utilities to serve each of the 43 residential lots. The applicant also proposes to remediate or repair some landslides on-site to accommodate proposed development. Individual homes would be developed by future owners of residential lots. Exhibit 3.0-3 summarizes proposed lands uses and Exhibit 3.0-4 illustrates the Master Plan site plan.

The 43 residential lots are proposed in the following areas:

- Thirty (30) lots contiguous to the Hill Haven neighborhood, with access via Mountain View Drive to proposed Lots 1 through 3 and via Ridge Road to proposed Lots 4 through 20, 24, 35 through 43.
- Three (3) lots on Paradise Drive, with access via a new shared driveway off Paradise Drive to proposed Lots 21 through 23 adjacent to Old Tiburon at the existing Town boundary.

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1 Previous environmental documents prepared for the Town of Tiburon in 1996 assessed the 110-acre project site and a second 15-acre parcel, located east of Paradise Drive along the shoreline of San Francisco Bay. The latter 15-acre parcel (APN 59-231-02) is now in a different ownership and is not part of the project examined in this EIR.
Ten (10) lots off Paradise Drive near MMWD’s Paradise Water Tank, with access via Forest Glen Court, a new road generally following the existing water tank service road alignment, to proposed Lots 25 through 34.

In addition to the certification of the EIR, the proposed 2008 Easton Point Residential Development will require the following approvals from Marin County:

- Master Plan approval
- Precise Development Plan approval
- Tentative and Final Subdivision Map approval
- Design Review approval for construction of future homes on individual lots
- Exception to Marin County Subdivision Standards (an exception is requested to Title 24, Development Standards, Section 24.04.110 (road width))
- Rezone the project site from Single Family Residential (R-1) and Residential Multiple Planned District (RMP-0.2) to Residential Single Family Planned (RSP).

2.2 SUMMARY OF ALTERNATIVES ANALYSIS

This Draft EIR examines four alternatives to the 2008 Easton Point Residential Development project as presently proposed.

- **Alternative 1**, the No Project Alternative, assumes that no development would occur on the 110-acre project site. Mountain View Drive and Ridge Road would not be extended onto the project site. The upper elevations of the project site would maintain the same visual appearance, and there would be no need to construct the new water tank that is proposed for Parcel C.

- **Alternative 2** would create 31 residential lots plus one remainder lot for development of single family homes (50.54 acres). In addition two parcels (Parcel A 57.30 acres and Parcel B 1.99 acres) would be offered for dedication to the Marin County Open Space District. Parcel B is proposed as a Marin dwarf flax (a special status plant species) preserve. A 180,000-gallon concrete water tank would be constructed on Parcel C (0.17 acres). Individual homes would be developed by future owners of residential lots. Exhibit 6.0-1 summarizes proposed lands uses and Exhibit 6.0-2 illustrates the Alternative 2 site plan.

Residential lots are proposed in the following areas:

- Seventeen (17) lots contiguous to the Hill Haven neighborhood, with access via Mountain View Drive to proposed Lot 1 and via Ridge Road to proposed Lots 2 through 17.

- Four (4) lots on Paradise Drive, with access via a new shared driveway off Paradise Drive to proposed Lots 18 through 21 adjacent to Old Tiburon at the existing Town boundary.

- Ten (10) lots off Paradise Drive near MMWD’s Paradise Water Tank, with access via Forest Glen Court, a new road generally following the existing water tank service road alignment, to proposed Lots 22 through 31.
One (1) Remainder Lot with access from Paradise Drive.

- **Alternative 3** proposes the same number of residential lots as the proposed project (43), however, the lot sizes would be substantially smaller and have been relocated to reduce the visual presence/prominence of the project within particular views that would constitute significant impacts to visual quality. With **Alternative 3** residential lots are proposed in the following areas (see Exhibit 6.0-41):

  Twenty-one (21) lots (Lots 1 through 21) would be accessed via an extension of Ridge Road from the Hill Haven neighborhood.

  Six (6) lots (Lots 22 through 27) on Paradise Drive that would be accessed from Paradise Drive via a shared driveway.

  Sixteen (16) lots (Lots 28 through 43) off Paradise Drive near the MMWD water tank.

- **Alternative 4** is a revised development alternative with the same number of lots as the proposed project. This alternative features a reconfiguration of the proposed project’s residential lot pattern, and reduced lot sizes in an attempt to reduce impacts on biological resources that would result from the project as it is currently proposed. With **Alternative 4** residential lots are proposed in the following areas (see Exhibit 6.0-42):

  Twenty-seven (27) lots contiguous to the Hill Haven neighborhood that, similar to the proposed project, would be accessed via an extension of the existing Ridge Road. **Alternative 4** would develop 12 lots (Lots 16 through 27) fronting along Ridge Road, west of lots that front on Mt. Tiburon Road. With **Alternative 4** development would be less expansive downslope to the north and south of proposed Ridge Road extension, effectively reducing the potential to disturb seasonal wetland, Marin dwarf flax, and coast live oak woodland located downslope from the proposed extension of Ridge Road.

  Five (5) lots in the south east boundary of the project site where Coast live oak, native and non-native grassland exist where the proposed project would be developed with three larger lots.

  Eleven (11) lots off Paradise Drive near the existing MMWD Paradise Water Tank that would be accessed either directly from Forest Glen Court or from a new shared driveway that would connect with Forest Glen Court.

A complete description of the alternatives is contained in **Chapter 6.0 Alternatives to the Proposed Project**.

The State **CEQA Guidelines** require that an EIR’s analysis of alternatives identify the “Environmentally Superior Alternative” among all of those considered. Based on a comparison of impacts discussed in **Chapter 6.0 Alternatives to the Proposed Project**, the EIR finds that of the build alternatives, **Alternative 2** (32-Unit Lower Density Alternative) would be the environmentally superior alternative. Although the significant impacts associated with **Alternative 2** would be similar to the proposed project, the reduced number of housing units (32 versus 43) would result in less disturbance to the project site and thus reduce the degree of several impacts. These impacts, however, would remain significant and in need of mitigation measures.
2.3 SCOPING COMMENTS AND AREAS OF CONTROVERSY

In compliance with CEQA, Marin County sent a Notice of Preparation (NOP) on January 9, 2009 to government agencies, special service districts, organizations, and individuals with an interest in or jurisdiction over the project. This step ensured early consultation with these entities on the scope of the EIR.

On January 29, 2009 Marin County conducted a public scoping session on the proposed project. The purpose of the meeting was to identify environmental issues and concerns the public has about the project in order to evaluate those issues in this EIR. After reviewing comments relevant to the 2008 Easton Point Residential Development, Marin County identified the following areas of controversy that are further evaluated in this Draft EIR.

**Land Use and Planning** – Concern with consistency of the proposed 2008 Easton Point Residential Development project with adopted Marin County land use plans.

**Transportation** – Concerns were raised regarding impacts to the hillside neighborhood streets located south and southeast of the project site, an area commonly referred to in public comments as the “old Tiburon neighborhood”. These concerns include the physical effects project traffic would have on the paved surfaces of such streets; the project’s contribution towards cumulative traffic impacts with an emphasis on existing construction vehicle traffic for current ongoing residential construction/remodel projects in the neighborhood; traffic and pedestrian safety where these streets are difficult to navigate; emergency vehicle access; and how the project would impact the capacity of these streets in the event of an emergency evacuation. The impact of construction vehicle traffic on the existing neighborhood streets was a concern. Concerns were also raised regarding the project’s impacts to regional roadways including Tiburon Boulevard, Paradise Drive, Trestle Glen Boulevard, and U.S. Highway 101 from both new residents and construction traffic; and impacts to safety where new access is proposed off of Paradise Drive.

**Air Quality** – Concerns raised included dust from earthmoving and other construction activities; the potential for naturally occurring asbestos within serpentine rock to be released during grading activities; diesel exhaust from construction equipment; and the project’s contribution towards greenhouse gas emissions and climate change issues.

**Noise** – Concerns raised included noise generated during the construction process by construction vehicles and the operation of heavy equipment. Commentors expressed a particular concern for the duration of time construction would occur.

**Geology and Soils** – Concerns raised included the stability of existing landslides located at the project site; grading impacts on the hillside for roads, retaining walls, and building footprints, with an emphasis on the management of excess excavated materials; and the secondary impacts site grading could have on biological resources and water quality. Additional concerns addressed include seismic safety in the event of an earthquake.

**Hydrology and Water Quality** – Concerns raised included the proposed project’s hydrologic and water quality impacts to: the Lands of Keil spring, Keil Pond, Keil Cove, and Railroad Marsh.

**Biological Resources** – Concerns raised focused on potential impacts to the federally-threatened California red-legged frog (*Rana aurora draytonii*); to special-status plants including the Marin dwarf flax (*Hesperolinon congestum*), Tiburon Indian paintbrush (*Castilleja affinis ssp. neglecta*), Tiburon jewel-flower (*Streptanthus niger*) and serpentine reed grass (*Calamagrostis ophitidis*); to native plants...
and animals as a result of the introduction of exotic plants and domestic animals; and to habitats such as oak woodlands and serpentine bunchgrass.

**Public Services** – Concerns raised regarding the proposed project’s fire flow and water pressure requirements; emergency evacuation; emergency vehicle access; water supply and impacts associated with the construction of the proposed water supply tank; impacts to existing sewer and wastewater treatment facilities; and impacts related to increased energy use. Also, concerns regarding the proposed project’s impacts on existing parks, recreation, open space, and trail facilities were raised.

**Visual Quality** – Concerns raised regarding the project’s impacts to visual quality included visual impacts resulting from construction of the project including fencing, retaining walls, roads, and home construction on or near ridgelines. Also, concerns were raised regarding visual impacts resulting from construction of the new water tank as proposed.

**Cultural Resources** – Concerns raised regarding the proposed project’s impacts to cultural resources include concerns for the project’s impacts on Native American artifacts, historically significant trails (such as the Spanish Trail), and other cultural resources, such as the off-site Keil Cove.

### 2.4 SIGNIFICANT IMPACTS AND MITIGATION MEASURES

This section presents a complete summary of the environmental impacts discussed in this Draft EIR and detailed in *Chapter 5.0 Environmental Setting, Impacts, and Mitigation Measures*. The following levels of significance were used to identify impacts in Exhibit 2.0-1 and elsewhere in this Draft EIR.

- **Significant Impact (S)** – An adverse change in the environment, where the change exceeds a specific significance threshold. These thresholds are described under the "Significance Criteria" in sections 5.1 through 5.9.

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

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

Topical sections in *Chapter 5.0 Environmental Setting, Impacts, and Mitigation Measures* list the thresholds and criteria used to determine significance for the respective environmental subject.
### Exhibit 2.0-1

**Summary of Impacts and Mitigation Measures**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significance Before Mitigation</th>
<th>Mitigation Measure</th>
<th>Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transportation</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>5.1-1 Existing-Plus-Project Impacts on Study Intersections.</strong> Project traffic would increase traffic volumes at study intersections along Tiburon Boulevard and Paradise Drive.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
<td>LTS</td>
</tr>
<tr>
<td><strong>5.1-2 Cumulative Buildout-Plus-Project Impacts to Study Intersections.</strong> Cumulative-plus-project conditions would increase peak hour traffic volumes at all study intersections. With planned improvements, all but the following three study intersections would operate acceptably, with or without the project, during the AM and PM peak hours:</td>
<td>S</td>
<td>No mitigation would be required.</td>
<td>LTS</td>
</tr>
<tr>
<td>• The signalized Avenida Miraflores / Tiburon Boulevard intersection would operate unacceptably at LOS E during the weekday AM peak hour.</td>
<td></td>
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<tr>
<td>• The signalized Rock Hill Drive / Tiburon Boulevard intersection would operate unacceptably at LOS E during the weekday PM peak hour.</td>
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<tr>
<td>• The unsignalized Reed Ranch Road southbound left turn to Tiburon Boulevard would operate unacceptably at LOS F during the AM and PM peak hours.</td>
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</table>

No improvements are planned for these intersections. The addition of project traffic would increase the average delay at the Avenida Miraflores and Rock Hill Drive intersections, and this increased delay would be cumulatively considerable.

At the Reed Ranch Road/Tiburon Boulevard intersection, southbound left turns from Reed Ranch Road would continue to operate at an

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2 **Exhibit 2.0-1** contains a summary of mitigation measures. For complete details for each mitigation measure please refer to the appropriate analysis section.
2.0 Summary of Findings
2008 Easton Point Residential Development Draft EIR

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significance Before Mitigation</th>
<th>Mitigation Measure ²</th>
<th>Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>unacceptabe LOS F, however, the flow of traffic on Tiburon Boulevard would remain at an acceptable LOS C. Per Marin County and Transportation Authority of Marin significance standards, the project’s impact at this intersection would not be cumulatively considerable.</td>
<td></td>
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<tr>
<td><strong>5.1-3 Safety Impact Due to Inadequate Distances Approaching the Unsignalized Intersections of Paradise Drive with Project Access Roads.</strong> Visibility for drivers approaching the intersection of Paradise Drive with the proposed driveway to Lots 21 through 23 and the proposed intersection of Forest Glen Court would be subject to the AASHTO standard for stopping sight distance. The Forest Glen Court intersection would, in the opinion of the EIR traffic analyst, result in a potentially unsafe condition.</td>
<td>S</td>
<td><strong>5.1-3</strong> Requires preparation of a right-of-way improvement plan that shows adequate sight distance would be provided and shall include improvements to the Forest Glen Court / Paradise Drive intersection to provide a minimum 158 feet of sight distance and widening of Paradise Drive to include four-foot shoulders with minimum 60-foot taper at the proposed Forest Glen Court intersection.</td>
<td>LTS</td>
</tr>
<tr>
<td><strong>5.1-4 Impact on Regional Roadways.</strong> The project would generate trips that would travel on Tiburon Boulevard and U.S. 101, which are two facilities that are designated as routes of regional significance as part of the County Congestion Management Program (CMP). U.S. 101 would experience a significant impact resulting from regional growth, including growth within Tiburon which includes the proposed project. This would be a significant cumulative impact.</td>
<td>S</td>
<td><strong>5.1-4</strong> The Marin Countywide Plan Final EIR identifies mitigation measures to reduce impacts on U.S. 101 (see Mitigation Measures 4.2-2, 4.2-9, 4.2-10, and 4.2-13 in the Marin Countywide Plan EIR). These measures include improved public transportation service countywide, and additional travel lanes on U.S. 101 to provide additional road capacity.</td>
<td>SU</td>
</tr>
<tr>
<td><strong>5.1-5 Project Impact on Transit.</strong> Project related traffic would not adversely impact transit operations. Increase in demand for transit generated by the proposed project would be met by existing services.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
<td>LTS</td>
</tr>
<tr>
<td><strong>5.1-6 Project Impact on Bicycle Facilities and Bicycle Safety Issues.</strong> Project site residents would contribute to the number of bicyclists using Paradise Drive. The project also would add motor vehicle traffic to the roadway, which has limited areas for motorists to pass bicyclists given the narrow width and frequent curves. While not significant alone, this additional increment of motor vehicle and bicycle traffic would exacerbate already constrained conditions. This would be a significant cumulative impact.</td>
<td>S</td>
<td><strong>5.1-6</strong> Requires improvements that would help alleviate cumulative impacts that includes 5.1-6(a) specific lane improvements for Paradise Drive, 5.1-6(b) provision of Class III bike route, Countywide Bicycle Route Guide signs, warning and advisory signs along project frontage, and 5.1-6(c) bike route signs, Countywide Bicycle Route Guide signs, appropriate warning and advisory signs for northbound traffic, along the opposite side of Paradise Drive (east side of the project frontage of Paradise Drive) and also selective widening the shoulder pavement along the east side of the project frontage of Paradise Drive within the public right-of-way.</td>
<td>LTS</td>
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</table>
### 5.1-7 Project Impact on Pedestrian Circulation

Project implementation would not result in disruptions to existing pedestrian facilities, or interfere with planned pedestrian facilities. Project residents would be expected to contribute slightly to the number of pedestrians using Paradise Drive and Hill Haven neighborhood streets. The project could improve existing conditions in the Lyford’s Cove / Old Tiburon and Hill Haven neighborhoods. Paradise Drive fronting the project site is a roadway considered unsafe for pedestrian use. The project would add traffic to this unsafe existing roadway condition. While not significant alone, this additional increment of motor vehicle and pedestrian traffic would exacerbate already constrained conditions. This would be a significant cumulative impact. Additionally, the project site provides no pedestrian accommodation (no sidewalks or pathways outside the travel lane) on its proposed roadways, and there is no public access through the site other than an access easement to Old St. Hilary’s Open Space along 20-foot wide roadways.

<table>
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<th>Significance Before Mitigation</th>
<th>Mitigation Measure</th>
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<tr>
<td>5.1-7</td>
<td>S</td>
<td>5.1-7(a)</td>
<td>LTS</td>
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<tr>
<td></td>
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<td>Requires roadway improvements to maximize widening and refuge areas for pedestrians at Forest Glen Court / Paradise Drive (consistent with Mitigation Measure 5.1-3). Design the intersection of Lots 21 to 23 driveway / Paradise Drive to provide maximum amount of widening and paved refuge area for pedestrians. Requires shoulder widening as required with Mitigation Measure 5.1-6 (a thru c).</td>
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<td>5.1-7(b)</td>
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<td>Prohibits parking of dumpsters along Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets if the dumpster would intrude into the travel lanes.</td>
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<td>5.1-7(c)</td>
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<td></td>
<td></td>
<td>Requires on-site roadway improvements that include:</td>
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<td>• Provide sidewalks on one side of each road.</td>
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<td></td>
<td>• Provide a public pathway connecting the Mt. Tiburon Court sidewalk to Old St. Hilary’s open space.</td>
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<td>• Supplement the construction access road to provide steps through steep sections in order that the road would serve as a pedestrian connection through the development.</td>
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<td>• Provide all-weather surface pathways consistent with the Marin Countywide Plan trail plan.</td>
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### 5.1-8 Project Impacts Related to Vehicular Site Access

Access to the proposed residential development would be provided at four locations connecting to off-site roads: two local roads in the Town of Tiburon, and two new intersections with Paradise Drive. The Marin County Code specifically addresses “new driveway transitions” and both the Marin County Code and Tiburon General Plan specifically address intersections with Paradise Drive.

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<th>Mitigation Measure</th>
<th>Significance After Mitigation</th>
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<tr>
<td>5.1-8</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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</table>

### 5.1-9 Project Impacts Related to Project Site Emergency Access

The project would require provision of adequate internal circulation for vehicles, pedestrians, emergency vehicles and fire trucks. In three locations driveways would be too narrow to meet TFPD standards, in four locations turnouts would be needed to meet TFPD standards, and the construction access road, proposed to be closed after construction to all but emergency vehicle access, would not meet TFPD standards for grade.

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<th>Significance Before Mitigation</th>
<th>Mitigation Measure</th>
<th>Significance After Mitigation</th>
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<td>5.1-9</td>
<td>S</td>
<td>5.1-9</td>
<td>LTS</td>
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<td></td>
<td></td>
<td>Requires adequate driveway widths and turnouts per TFPD requirements for driveways as required by the TFPD and “no parking” signs, and closure of the construction access road to all use after cessation of construction, unless specifically approved by the TFPD for emergency use.</td>
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## 2.0 Summary of Findings

2008 Easton Point Residential Development Draft EIR

<table>
<thead>
<tr>
<th>Impact</th>
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<th>Mitigation Measure 2</th>
<th>Significance After Mitigation</th>
</tr>
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<tbody>
<tr>
<td>5.1-11 Provision of Safe On-Site Roads. The proposed design of on-site roadways would not meet Marin County minimum standards and raises safety concerns related to road widths and shoulder space.</td>
<td>S</td>
<td>5.1-11 Requires design of the three on-site roads (Ridge Road, Mt. Tiburon Court and Forest Glen Court) comply with County standards, provision of pedestrian sidewalks or all-weathered pathways, and combining proposed access drives for Lots 27 and 28 and Lots 32 and 33 to avoid blind curves.</td>
<td>LTS</td>
</tr>
<tr>
<td>5.1-12 Provision of On-Site Parking Space. The project would create a demand for parking spaces. This would be a less-than-significant impact per Marin County Code requirements, but would raise concerns for roadway safety due to the narrowness and steepness of on-site roadways and the tendency of residents and visitors to park near their destination while ignoring on-street parking prohibitions.</td>
<td>S</td>
<td>5.1-12 Requires additional on-site parking including four on-site parking spaces plus four additional spaces within building site and on-lot driveway space. This mitigation measures also allows for optional locations for parking spaces.</td>
<td>LTS</td>
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</tbody>
</table>
| 5.1-13 Construction Traffic Impacts. The project could add significant amounts of construction traffic to Paradise Drive, adding to the existing sight distance safety concerns at the Paradise Drive / Forest Glen Court intersection, and raising safety concerns about construction truck use of Paradise Drive (related to tight curves and narrow segments of the roadway where large trucks would wander into the opposite direction travel lane). Construction trips also would damage pavement on affected roads and have the potential to disrupt the residential environment. | S | 5.1-13(a) The applicant shall implement all measures regarding the construction access road as proposed by Ghilotti Construction Company and Red Horse Constructors, Incorporated.  
5.1-13(b) Requires implementation of the Construction Management Plan with modifications that:  
• Prohibit construction vehicles / activity within existing residential neighborhoods except as necessary access for development of Lots 1, 2 and 3.  
• Control all uses of the proposed temporary construction access roadway as a constant safety precaution.  
• Implement all project traffic control elements including consolidation of approved routes, informing residents of | LTS |
### Air Quality

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<tr>
<td>5.2-1  Construction-Period Air Pollutant Emissions.</td>
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<td>construction activities and duration, and using flag persons and flag trucks along construction routes.</td>
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<td>• Initial improvements to Paradise Drive and Forest Glen Court to enhance traffic safety during construction.</td>
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<td>• Include provisions in contractors’ construction contracts to prohibit parking of construction vehicles anywhere other than on-site.</td>
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<td>• Precautions in the event of construction traffic queuing on Paradise Drive.</td>
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<td>• Repair of any deteriorated pavement along Tiburon Drive - Paradise Drive identified by a before and after pavement evaluation program.</td>
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<td>• Obtain County and Town approval for construction truck haul routes and establish haul truck hours for project construction traffic.</td>
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5.2-1 Reduces air pollutant emissions during construction by requiring implementation of the Construction Management Plan with modifications that:

- Require the use of off road construction equipment that meets stricter air pollutant emission standards.
- Prohibit the use of diesel powered equipment that would emit dark smoke (exceeding 40-percent opacity) for more than three minutes of any one hour of operation.
- Require any diesel equipment standing idle more than five minutes be turned off, with exception to rotating drum concrete trucks.
- Adds PM$_{10}$ control measures to the Construction Management Plan.

LTS
## 2.0 Summary of Findings
### 2008 Easton Point Residential Development Draft EIR

#### Impact

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<tr>
<td><strong>5.2-2 Generation of Airborne Asbestos.</strong> Grading of the project site may disturb soils containing serpentine, possibly releasing asbestos fibers into the air. With conformance to BAAQMD regulations this would be a less-than-significant impact.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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<tr>
<td><strong>5.2-3 Greenhouse Gas Emissions.</strong> New large residences would be an additional source of GHG emissions, primarily through consumption of energy for transportation and energy usage that would not exceed the BAAQMD GHG significance thresholds.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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### Noise

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</table>
| **5.3-1 Construction Noise.** Construction of the Easton Point Residential Project would temporarily increase ambient noise levels in the site vicinity. Given the potential for substantial increases in noise at nearby residences as a result of project construction and the likelihood that substantial noise increases would occur intermittently for more than one year, this would be a significant impact. | S | **5.3-1** Requires mitigation of construction noise impacts by implementation the proposed Construction Management Plan with modifications that include:  
- Modify the construction hours to be consistent with Section 6.70.030(5) of the Marin County Code.  
- Utilize “quiet” models of air compressors and other stationary noise sources where technology exists.  
- Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.  
- Prohibit unnecessary idling of internal combustion engines.  
- Prohibit audible construction workers’ radios on adjoining properties.  
- Notify neighbors of the construction schedule prior to the beginning of each phase that would generate substantial noise (i.e., five dBA or more above ambient levels and exceeding 60 dBA L_{eq}). | SU |
### Geology and Soils

**5.4-1 Landsliding**  Numerous landslides are present on the project site, some of which are located in or within 100 feet of proposed building sites and public improvements. Other landslides are located in proposed open space areas and on portions of lots over 100 feet from existing landslides. If all of the (dormant or active; Risk Levels A and B) landslides are not improved, mitigated or avoided, some of the landslides could reactivate, causing a potential risk to life and property.

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| **S**  | **5.4-1** Requires a design level comprehensive geotechnical report shall be prepared and submitted to Marin County prior to issuance of any grading permits. The geotechnical report shall include an engineering geologic and geotechnical investigation on a lot-by-lot basis before development of roadways and utilities and within proposed building envelopes of each individual lot. The report shall include a comprehensive design-level grading plan including a landslide stabilization program on all lots and a long-term maintenance program for the stabilization program. The repair program shall be implemented by the applicant. Furthermore:  
• All landslides shall be eliminated, repaired, improved, or avoided in accordance with Marin County landslide mitigation policy and the landslide criteria and mitigation policy established for this project by Miller Pacific Engineering Group.  
• The limits of each landslide present on the project site shall be verified.  
• Landslide 9 shall be completely repaired in accordance with Miller Pacific’s criteria for landslide repair. Landslide 9 is less than 100 feet from the proposed building site for Lot 23. This landslide is only scheduled for improvement, which would be inconsistent with the project’s landslide mitigation policy. Stabilizing this small landslide would eliminate the inconsistencies present in the conceptual repair plan.  
• The geotechnical report shall include stability calculations for landslides or portions of landslides within 100 feet of the building envelopes or public improvements to confirm that proposed repair methods would provide a factor of safety of at least 1.5 for static conditions and greater than 1.0 for pseudo-static (seismic conditions).  
• For landslides that shall not be repaired or improved it shall be documented that the proposed project will not have an adverse impact on the existing landslide and that the project LTS | |
### Impact | Significance Before Mitigation | Mitigation Measure | Significance After Mitigation
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#### 5.4-2 Slope Stability
Unrepaired areas of colluvial and landslide deposits could erode or fail locally until they reach equilibrium.

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<tr>
<th>S</th>
<th>5.4-2 The applicant and individual lot owners and their respective geotechnical consultants shall implement the following measures in order to mitigate the impacts of low shear strength of some fill soil materials and possible erosion of some slopes.</th>
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<td>• Evaluate the strength and other soil index properties of the on-site earth units. In areas that require removal and replacement to create an earth filled buttress, within 100 feet of a proposed building envelope or public improvement, excavate and replace any loose colluvium or other earth units encountered with certified, engineered compacted fill soil and add proper subdrainage.</td>
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<td></td>
<td>• Design drainage facilities, on cut and fill slopes, to include terrace drains every 30 feet of vertical height on all slopes. The terrace drains shall have a minimum flowline gradient of six percent to make them self-cleaning (a minimal tenet of the Uniform Building Code). They also shall be fitted with downdrains every 150 linear feet of terrace length to allow for quick drainage (also UBC).</td>
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#### 5.4-3 Seismicity
Strong seismic shaking is expected to occur on the site some time during the effective “life” of development.

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<tr>
<th>S</th>
<th>5.4-3 All site development shall comply with all applicable seismic design provisions of the most recent County-adopted Uniform Building Code criteria for structures in Seismic Zone 4.</th>
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<tr>
<td>5.4-4  Groundwater. The conceptual landslide stabilization plan is intended to increase the stability of existing on-site landslides through proposed mitigative measures such as earth fill buttresses, buried pier and grade beam walls, and subdrains. All of these methods of landslide improvement have the potential to convert groundwater to surface water. By intercepting groundwater emanating from the fractured bedrock on the ridges and perched within colluvial or landslide deposits, subsurface water recharge could be significantly reduced. This could limit the quantity of groundwater available to the seeps, springs (including Keil Spring) and the seasonal pond.</td>
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<td>5.4-5  Artificial Fill Areas. New construction on existing artificial fill, if present, could settle unevenly and be damaged or could stimulate or accelerate erosion. Areas of existing artificial fill appear to be limited to access roads, the Paradise Water Tank, and along site boundaries. If such materials are present in the vicinity of proposed grading, they could settle non-uniformly or be subject to erosion. S</td>
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<td>5.4-6 Expansive Soils. Development (structures, roads, utilities) located on expansive soils could be damaged by dislocations caused by cyclic shrinking and swelling.</td>
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3 See Section 5.5 Hydrology and Water Quality Impact 5.5-3 Site Drainage Patterns – Erosion and Downstream Sedimentation for a discussion of on-site erosion impacts.
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<td>conditions present at proposed development sites.</td>
<td><strong>Mitigation Measure</strong></td>
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<td>Typical measures to treat expansive soils shall include the following (or their equivalent):</td>
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<td>□ Pre-saturating fill soils and placing wet fill soils (above optimum moisture content) to expand the soil, thereby reducing potential damage to concrete by allowing room for future shrink / swell movement of the soils.</td>
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<td>□ Placing a non-expansive imported soil in the upper part of building footprints.</td>
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<td>□ Burying expansive soils deep in fills.</td>
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<td></td>
<td>□ Treating soil with lime.</td>
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<td>□ Mixing expansive soils with less expansive soils.</td>
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<td></td>
<td>□ Designing foundation footing systems to incorporate measured variations of soil swell with effective confinement (dead weight).</td>
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<td>• Design residential development on individual lots to account for each site's expansive soils. Measures typically incorporated in building design shall include (or their equivalent):</td>
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<td></td>
<td>□ Strengthening foundations (beam).</td>
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<td>□ Using suspended wood floors, drilled pier and grade-beam foundations, floating slabs, or pre-stressed (post-tensioned) slabs on-grade.</td>
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<tr>
<td></td>
<td>□ Treating with chemicals.</td>
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<td></td>
<td>□ Combining two or more of these techniques.</td>
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Hydrology and Water Quality

5.5-1 Water Quality. Project implementation would increase the area devoted both to impervious surfaces (roadways, driveways and roof tops) and to potentially irrigated landscaping. Suburban automobile traffic can contribute oil and grease, and heavy metals to site impervious surfaces, and thus to stormwater runoff. Residential lot development could be accompanied by applications of fertilizers and chemicals (such as herbicides and pesticides). Over-irrigation, combined with accidental spills or releases of fertilizer or pesticides / herbicides, could result in downstream migration of contaminated runoff to drainageways tributary to Keil Pond and Central San Francisco Bay. These risks to water quality would be a significant impact. Due to the listing of Central San Francisco Bay under the Clean Water Act, Section 303(d) list of impaired water bodies as impaired for mercury, polycyclic aromatic hydrocarbons (PAHs), Dioxin compounds, Furan compounds PCBs, Selenium and several pesticides, including chlordane, DDT and dieldrin, even minor amounts of these substances above ambient watershed levels would result in a significant impact.

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| S      | 5.5-1(a) Requires implementation of construction BMPs shown on the applicant's Stormwater Control Plan, and preparation of a Stormwater Pollution Prevention Plan (SWPPP) to be implemented during construction that pays particular attention to the following:  
- The construction access road and associated vehicular pollutants.  
- Vehicle wash areas to ensure that sediment is not tracked onto Paradise Drive.  
- Fuel and other toxic compound storage.  
- BMPs (best management practices) to control sediment and erosion.  
- Revegetation  
- Trash control  

Marin County Code Section 24.04.627, provides additional information on SWPPP requirements.  
5.5-1(b) Requires implementation the post-construction BMPs shown on the applicant's Stormwater Control Plan that detains the post development increase in peak flow rates, directs roof runoff and runoff from other future residential impervious surfaces to bioretention areas, and installing Filterra Bioretention Systems in roadway catch basins. Also requires preparation of a Stormwater Control Plan as a stand alone document that details post-project stormwater control measures and utilizes information from the Marin County Code Section 23.18.093 and the Marin County document, Guidance for Applicants, Stormwater Quality Manual for Development Projects in Marin County.  

| LTS |

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<tr>
<td>5.5-2  On-Site Drainage Patterns – On-Site and Off-Site Flooding. Construction of houses, roads and drainage facilities in Watersheds B, D, C, E, J, L, M, N, O, P, R, S, V, and W would cause a minor transfer of runoff across watershed boundaries. Development in these watersheds, would result in the capture of roadway runoff via storm drains, with the release of captured water onto neighboring slopes or into site drainageways. To provide adequate sight distances for drivers entering Paradise Drive in the vicinity of Forest Glen Court and access driveway (Lots 21 through 23) intersections, portions of the adjoining hillslopes would be graded and retaining walls constructed. These project activities could result in modifications to or obstruction of roadside drainage ditches and cross-roadway culverts not presently incorporated into the proposed project. Such modifications could decrease the efficiency of local stormwater drainage and increase the risk of episodic nuisance flooding along the insloped, shoulder drainage ditches and along Paradise Drive.</td>
<td>S</td>
<td>5.5-2 Following the completion of hillslope grading and retaining wall construction for sight distance improvement, clear stormwater ditch segments along Paradise Drive of extraneous cut material and return ditch cross-sections, slopes and drainage direction, and hydraulic capacities to pre-disturbance conditions. Ensure that road culverts are not buried or obstructed by excavation debris.</td>
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<tr>
<td>5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation. Construction of impervious surfaces and storm drain systems in the site’s watersheds would alter site drainage patterns, concentrate stormwater runoff, increase peak flow rates in on-site drainageways and increase the risk of incision and instability in receiving drainageways and on hillslopes. In addition, grading of lots and roadways and installing utilities would disturb areas of the site</td>
<td>S</td>
<td>5.5-3(a) Cites measures contained in Mitigation Measure 5.5-1(a) that require compliance with NPDES Construction General Permit requirements. Also requires a provision added to CC&amp;R’s stating the Property Owners Association is responsible for ensuring that the developer of each lot be required to meet all conditions specified in the NPDES Construction General Permit.</td>
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<td>and expose bared soil surfaces to the erosive forces of rainfall and runoff. This could result in downstream sedimentation and obstruction of hydraulic structures (culverts and catch basins), as well as increase the risk of sedimentation in Keil Pond and Railroad Marsh.</td>
<td></td>
<td>5.5-3(b) Reiterates the requirement for a Stormwater Pollution Prevention Plan (SWPPP) (Mitigation Measure 5.5-1(a)) and a Stormwater Control Plan (Mitigation Measure 5.5-1(b)), which both include measures to reduce erosion and downstream sedimentation.</td>
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<td>5.5-3(c) Requires geomorphic evaluations and installation of rip rap receiving pads and/or velocity reducers at each point discharge location. Also provides specific instruction for the installation of erosion and sedimentation control equipment with respect to the project sites steep topography. Requires maintenance procedures for devices established and transferred to the Property Owners Association.</td>
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<td>5.5-3(d) Requires implementation of Mitigation Measure 5.5-2.</td>
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<td>5.5-3(e) Provides standards for final design of site stormwater runoff detention facilities to ensure runoff storage volume sufficient to mitigate for the volume differential between the pre- and post-development, for 100-year rainstorm.</td>
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5.5-4 Groundwater Recharge and On-Site Hydrology. Landslide repair or improvements required to stabilize existing landslide deposits could impact three seeps in Watershed J, one seep and a seasonal pond in Watershed L, the seep on the north side of Drainageway 1 in Watershed E, and the spring in Watershed C, by reducing or eliminating the seasonal extent of groundwater recharge to these features. In addition, the lower reaches of Drainageways 2 and 3 may be dewatered through the installation of subdrains below the drainageways as part of the proposed landslide stabilization measures. Changes in the seasonal hydrology (i.e. duration and extent) of these on-site hydrologic features, while potentially detrimental to on-site wetland features, would result in less-than-significant impacts to on-site hydrology.

LTS

No mitigation would be required.

LTS

5.5-5 Groundwater Recharge and Off-Site Hydrology. Landslide repair and improvements required to stabilize existing slopes for the construction of homes could result in impacts to springs and seeps at the project site and/or conversion of site groundwater to surface water.

LTS

No mitigation would be required.

LTS
### Impact of Construction Impacts

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<tr>
<td>Water quality and quantity, including Keil Spring and the Keil property spring-based water supply.</td>
<td>S</td>
<td>5.5-6 Requires installation a water conveyance system to link the landslide improvement area subdrains to the water storage system on the Keil property. Depending on hydraulic constraints, this converted drain water could be conveyed to either the upslope redwood storage tank or the cisterns. Since all Keil property water system components are linked by piping and pumps, the link could be constructed to the upper redwood storage tank. Implementation of this mitigation measure would require the agreement and cooperation of the owners of the Keil property.</td>
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<td>On-site peak flow rates, existing storm drain capacities and downstream flood protection.</td>
<td>S</td>
<td>5.5-7 Requires implementation of Mitigation Measure 5.5-3(c) and 5.5-3(e) to minimize increases in peak flows and runoff volumes during rainstorms with two-year to ten-year recurrence intervals, and / or to minimize the risk of drainageway instability, downstream sedimentation, culvert blockage and local flooding.</td>
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The addition of impervious surfaces in the form of pavement and roof coverage would eliminate areas of existing groundwater recharge and increase local peak flow rates and surface runoff volumes. These potential impacts would reduce the discharge of off-site seeps and springs, including Keil Spring, and lower local groundwater tables, including those on the Keil property. Aside from the direct impacts to the Keil spring-based water supply (see Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply), the conversion of areas of potential groundwater recharge to areas of surface water runoff and the lowering of groundwater levels that regulate groundwater flow to Keil Spring and the Keil property would not substantially alter the character or pattern of groundwater and surface water flow. Therefore, the project would result in a less-than-significant impact on groundwater recharge and off-site hydrology.
storm drain system beneath the Hill Haven neighborhood. Uncontrolled increases in peak flow rates would result in potentially significant impacts. The applicant has prepared a Drainage Report proposing the use of detention facilities to maintain pre-project peak flow rates for design storms equal to or greater than the ten-year recurrence interval storm, eliminate potential impacts to existing and downstream storm drain capacities, and protect against downstream flooding. However, the proposed facilities would not mitigate for increases in peak flow or runoff volumes associated with storms of lesser recurrence intervals (e.g. two-year storm). These lower magnitude, yet significant, storm events are geomorphically important and can trigger adjustments in the dimensions of receiving drainageways via channel scour. Thus, project impact on on-site peak flow rates, existing drainage structures and downstream flooding would remain significant, even with implementation of the detention measures included in Drainage Report.

### Biological Resources

**5.6-1 Impacts to Special Status Plants.** Development and long-term use on proposed Lots 1 through 4, 6, 7, and 19 would eliminate 1.68 acres (75 percent) of habitat mapped in 2009 for the federally- and state-threatened Marin dwarf flax which occurs on the site and extends onto the Old St. Hilary’s Open Space Preserve. Development and long-term use on proposed Lots 1, 2, 6, and 7 would eliminate 0.06 acres (75 percent) of habitat mapped in 2009 for the serpentine reed grass (CNPS List 4). Landscape irrigation runoff, as well as the downdrift of landscape chemicals (herbicides, fertilizers) and non-serpentine fill and/or topsoils onto Old St. Hilary’s Open Space from the building site of Lot 1 could result in indirect impacts to three special status plant species occurring within 100 feet of the project boundary, including the federally-endangered and state-threatened Tiburon Indian paintbrush, the federally-endangered and state-endangered Tiburon jewel-flower, and the Carlotta Hall’s lace fern (CNPS List 4).

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<td>5.6-1(a)</td>
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<td>Redesign the PDP site plan to preserve on-site populations of Marin dwarf flax and serpentine reed grass within Parcel A or Parcel B at a minimum preservation:loss ratio of 3:1, and to provide minimum setbacks from preserved populations of these species occurring on-site or off-site on Old St. Hilary’s Open Space Preserve to ensure these populations are not indirectly impacted by landscape irrigation run-off, or downdrift of landscape chemicals or non-serpentine fill or top soils. The minimum setback for all lots that occur adjacent to and upslope from off-site or on-site populations (as mapped in 2009) shall be 100 feet from the edge of the off-site population or the edge of populations preserved on-site within Parcel A or B to the closest lot building and landscape envelope. The minimum setback for all other adjacent lots shall be 50 feet from the edge of the off-site population or the edge of populations preserved on-site within Parcel A or B to the closest lot building and landscape envelope. 5.6-1(b) Ensures the in perpetuity preservation of special status plant habitat remaining after project development by requiring dedication of open space parcels with special status plant</td>
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### 5.6-2 Impacts to the California Red-legged Frog

No suitable breeding habitat for the California red-legged frog exists on-site. However, the proposed project would result in a significant impact to foraging habitat and dispersal movements for frogs which breed in Keil Pond. Should individual frogs occur on-site during project construction, such activities could result in mortality or harm to these individuals. Additionally, the project could result in degradation to downstream waters during project construction and operation and this could potentially result in impacts to the CRLF breeding habitat in Keil Pond.

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<td>popula-tions (Parcels A and B). As an alternative to fee title dedication of all or any portion of Parcel A or Parcel B and with the approval of Marin County, the POA may retain ownership of these parcels, or any portion of these parcels and dedicate a conservation easement to a public agency or non-profit approved by Marin County, in consultation with all applicable resource agencies (CDFG and USFWS). Any such parcel(s) shall be subject to the same Resource Management Plan as Parcel A and B (see Mitigation Measure 5.6-1(c) below).</td>
<td>Mitigation Measure 2(a) Requires avoidance of CRLF dispersal movements by redesigning the PDP in the Forest Glen area to provide connectivity via a minimum 100-foot wide woodland corridor between preserved woodland habitat in the southern and northern portions of the site. If the 100-foot wide corridor in not feasible the applicant shall create wetland habitat on site, or enhance existing wetlands on the project site so these wetlands function as breeding habitat.</td>
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<td>5.6-2(b) Establishes the preservation requirements for CRLF foraging and dispersal habitat at a minimum 3:1 preservation:loss ratio. Also includes provisions that, in the event a 3:1 ratio of on-site preservation is not feasible, the applicant would make up any difference by purchasing and preserving CRLF habitat off-site in the project region. This option requires a conservation easement and a CRLF Mitigation Plan.</td>
<td>5.6-2(c) Ensures the in perpetuity preservation of CRLF habitat remaining after project development through dedication of Parcel A to the MCOSD or another public agency or non-profit approved by Marin County. Also requires BMPs that are consistent with</td>
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| 5.6-3 Loss of Serpentine Bunchgrass. Project implementation would result in the loss of 9.72 acres of serpentine bunchgrass habitat. This would eliminate approximately 86 percent of this habitat on-site. Because this habitat is not abundant regionally, this loss would be a significant impact. Additionally, preserved serpentine bunchgrass habitat remaining after project implementation could be impacted by the indirect effects of irrigation run-off and downdrifting of non-serpentine fill soils and landscape chemicals used on lots located upslope from the preserved habitat. | S | 5.6-3(a) Requires the PDP be redesigned to preserve serpentine bunchgrass habitat within Parcels A and / or B at a minimum 3:1 preservation:loss ratio. 
5.6-3(b) Ensures the in perpetuity preservation of serpentine bunchgrass habitat remaining after project development thru dedication of all preserved habitat on site (Parcel A and B) to the MCOSD or public agency or non-profit approved by Marin County, as determined in consultation with all applicable resource agencies (CDFG and USFWS) for control and management. As an alternative to fee title dedication of all or any portion of Parcel A or Parcel B and with the approval of Marin County, the POA may retain ownership of these parcels, or any portion of these parcels and dedicate a conservation easement to a public agency or non-profit approved by Marin County, in consultation with all applicable resource agencies (CDFG and USFWS). Any such parcel(s) shall be subject to the same Resource Management Plan as Parcel A and B (see Mitigation Measure 5.6-1(c) below).
5.6-3(c) Requires implementation and funding of an RMP as set forth in Mitigation Measure 5.6-1(c). 
5.6-3(d) Requires barriers along downslope edges of the building envelopes of Lots 6 and 19 (and Lot 2 if not eliminated or relocated) to prevent landscape chemicals and irrigation from reaching downslope on- and off-site serpentine bunchgrass habitat. | LTS |
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| 5.6-4 *Loss of Coast Live Oak Woodland.* Project implementation would result in the loss of between 7.9 and 12.8 acres of coast live oak woodland and at least 742 trees as a result of infrastructure and home development, landslide repairs and compliance with Urban-Wildland Interface Restrictions. An unknown number of additional trees would be lost as a result of improvements along Paradise Drive at Forest Glen Court which may result in up to another estimated 0.5 acres of woodland habitat loss | S  | 5.6-4 *(a)* Preserves oak woodland habitat remaining on-site after project development thru preservation of habitat on Parcel A to the MCOSD or public agency or non-profit approved by Marin County, as determined in consultation with all applicable resource agencies for control and management. Also requires development, implementation and funding of a Resource Management Program that is consistent with Marin County’s Oak Woodland Voluntary Management Guidelines.  
5.6-4 *(b)* Intended to reduce or eliminate indirect impacts to preserved native trees and woodlands on- and off-site by requiring appropriate disposal of destroyed trees to prevent spread of SODS and use of protective fencing around on-site trees that are to be preserved during construction. | LTS |
| 5.6-5 *Disturbance to Jurisdictional Waters.* Proposed landslide repairs would result in permanent and temporary impacts to areas potentially considered jurisdictional by USACE, RWQCB and CDFG | S  | 5.6-5 *(a)* Requires dedication of Parcel A to preserve wetland and drainage habitats on-site and development and implementation of an RMP as set forth in Mitigation Measure 5.6-1(c).  
5.6-5 *(b)* Requires wetland delineation, that would be verified by USACE, to calculate permanent and temporary impacts to all jurisdictional areas, and entering into a streambed alteration agreement. Also requires a Riparian Mitigation and Monitoring plan be included in the RMP. | LTS |
| 5.6-6 *Introduction of Invasive Exotics.* Non-native plants used throughout the site in landscaping of lots or roads could become established in preserved habitats occurring on- or off-site. | S  | 5.6-6 *(a)* Requires a list of all exotic plants known to readily naturalize in habitats similar to those found on the project site which will be prohibited from use in landscaping. Also requires all applicant and lot owner landscape plans be submitted to the County for approval.  
5.6-6 *(b)* As set forth in Mitigation Measure 5.6-1(c), the RMP shall include a monitoring and management plan for non-native and / or invasive species, or pathogens, considered detrimental to protected resources (weed abatement, SODS management, CRLF predator control, etc.). | LTS |
| 5.6-7 *Disturbance to Active Bird Nests.* Construction activities could result in incidental impacts on birds of prey (raptors) and other birds which are protected by State and federal statutes should they be | S  | 5.6-7 Requires pre-construction surveys for active bird nests when project disturbance occurs during the breeding season. Also requires the following added to property CC&R’s: | LTS |
### Impact

nesting on the site during project implementation.

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| 5.6-8  Loss of Ordinance-Size Trees | S | • Within 30 days of beginning construction during the nesting season (February to August), have a qualified biologist survey construction areas and their immediate vicinity (within 250 feet) for active nests. Surveys shall be conducted according to a protocol developed in consultation with the CDFG.  
• Mark any active nests discovered during the pre-construction survey on a map and determine and establish an appropriate construction-free setback or buffer around each active nest by means of fencing or stakes with conspicuous flagging. The appropriate size of the buffer will be determined by the biologist based on the species and topography. No construction activities shall be permitted within the buffer area until all young have fledged and are observed by a qualified biologist to be foraging independently of the parents. | 5.6-8 Requires mitigation for loss of ordinance-sized trees by implementing the following:  
• The applicant shall provide a report to the county advising the number of ordinance-size trees that would be removed by site preparation, landslide repairs, construction of infrastructure prior to conducting these activities. Individual lot owners shall provide a report to the County advising of the number of ordinance-sized trees that would be removed on their lots prior to development of said lots (this requirement shall be written into CC&R’s by the applicant.  
• Fees in the amount of $500 for each ordinance-size tree that will be removed as a result of the project shall be paid into the RMP endowment fund.  
• These funds shall be ear-marked to manage and enhance preserved woodlands on the site in Parcel A through RMP activities such as the removal of non-native invasive plants, SODS management, replacement of dead or dying trees, etc., as well as to fund the re-establishment of woodland | LTS |

Project implementation would result in the loss of 742 trees as originally proposed as well as an unknown number of additional trees as a result of road improvements at the intersections of Paradise Drive and Forest Glen Court due to need to provide adequate sight distance. Many of the trees that would be lost are native species that would be considered ordinance-size by the County.
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|        | vegetation in areas that will be temporarily impacted as a result of landslide repairs. | 5.7-1(a) Same as Mitigation Measure 5.1-9.  
5.7-1(b) Requires applicant prepare an emergency radio coverage improvement plan, in cooperation with MERA, that shows adequate emergency radio coverage can be provided for Lots 21 through 23 and Lots 25 through 34. | LTS |
|        | The applicant shall be responsible for the payment of fees related to the loss of ordinance-size trees as a result of site preparation, landslide repairs and infrastructure development; while the individual lot owners shall be responsible for the payment of these fees related to development on their individual lots. | 5.7-2 Wildland-Building Fire Exposure. Development on the project site may expose houses and structures to wildland fire risks. With incorporation of 2003 Urban Wildland Interface Code requirements and TFPD requirements this would be a less-than-significant impact. | LTS |
|        | LTS No mitigation would be required. | 5.7-3 Cumulative Fire Service Impact. Cumulative development in the Tiburon Planning Area could generate additional demand for fire services which may require additional personal and equipment. This would be a significant cumulative impact. | LTS |
|        | LTS No mitigation would be required. | 5.7-4 Increased Demand for Police Protection Services. The Marin County Sheriff’s Department would provide police protection to the proposed 2008 Easton Point Residential Development. The proposed project would not generate a substantial increase in calls for police services and would not require additional officers or improvements to the Police Department facility. | LTS |
|        | LTS No mitigation would be required. | 5.7-5 Cumulative Increased Demand for Police Protection Services. Cumulative development in the unincorporated areas of Marin | LTS |
### Impact

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<td>County could generate additional demand for police services which would require the addition of approximately seven deputies. Marin County is currently planning for development of a new Emergency Operations Facility that would house the Sheriff’s Department.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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| 5.7-6 Increased Water Demand. Development of the project site would increase water demand on the MMWD. However, the MMWD has sufficient capacity to serve the project site. | S | 5.7-7 Requires the applicant work with the MMWD and develop a water supply plan that shows adequate water pressures would be provided. The water supply plan shall also include the following:  
- Increase the base elevation of the proposed water tank to 590 feet.  
- Replace the existing six inch water main in Paradise Drive with an eight inch water main from the proposed driveway for Lots 21 through 23 to Forest Glen Court. The length of the pipe replacement would be approximately 3,750 feet.  
- The applicant and/or property owners shall enter into a low pressure agreement with the MMWD that serves as a written release from liability for any damage or inconvenience associated with the low pressure domestic water service. If necessary the applicant or property owner must install a low pressure pump to provide adequate water pressure for the residence. | LTS |
| 5.7-7 Water Service Impacts. The proposed project includes construction of a new 180,000 gallon water supply tank and distribution lines within the project site. Due to constraints with the proposed water supply and distribution system and additional constraints with the existing water lines located under Paradise Drive, some homes would not have the standard water pressures required for domestic water service. | | | |
| 5.7-8 Inadequate Fire Flow. As designed the proposed project would have houses located at elevations where, in relation to the elevation of the proposed water tank, the water pressure would not be adequate to provide minimum fire flow requirements. | S | 5.7-8 (a) Requires approval for reduced fire flow requirements from the TFPD (as permitted in the 2007 California Fire Code) by implementing structural enhancements to proposed residences including but not limited to:  
- Upgrades to building sprinkler systems  
- Utilizing non-combustible exterior building materials | LTS |

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5 Marin Municipal Water District Code, Title 11 Water Service Rules and Regulations, May 2009
### 2.0 Summary of Findings

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<tr>
<td>5.7-9 <strong>Cumulative Water Supply Impacts.</strong></td>
<td>LTS</td>
<td>5.7-8 (b) Limit the size of proposed houses (total allowable square footage) as needed to meet fire flow requirements.</td>
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<td>5.7-8 (c) Upgrade existing water line located in Paradise Drive to an eight-inch line in order to provide adequate water flow and pressure for fire flow requirements.</td>
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<td>5.7-10 <strong>Increase to Wastewater Treatment Demand.</strong></td>
<td>LTS</td>
<td>No mitigation would be required.</td>
<td>LTS</td>
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<td>5.7-11 <strong>Increased Cumulative Wastewater Treatment Demand.</strong></td>
<td>LTS</td>
<td>No mitigation would be required.</td>
<td>LTS</td>
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<td>5.7-12 <strong>Temporary Increase to Energy Consumption during Construction.</strong></td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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### 2.0 Summary of Findings

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<td>5.7–13 Long-Term Energy Impacts. The 2008 Easton Point Residential Development would not generate a demand for energy services that would result in the need for new facilities, or the physical alteration of existing facilities, or exceed the ability of PG&amp;E to serve the project without substantially decreasing its ability to serve the existing population.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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<td>5.7–14 Cumulative Energy Impacts. Completion of the proposed project, along with the buildout projected by the Town of Tiburon General Plan and the Marin Countywide Plan would increase the demand for energy countywide. This increase in demand would not exceed the capacity of PG&amp;E’s electricity and gas systems or substantially impair PG&amp;E’s ability to provide these services.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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<td>5.7-15 Reed Union School District. Project implementation would generate approximately 21 students who would attend Reed Union School District schools.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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<td>5.7-16 Tamalpais Union High School District. Project implementation would generate about eight to 17 students who would attend Redwood High School.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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<td>5.7-17 Cumulative Public School Impacts. Both the Reed Union School District and the Tamalpais Union High School District would have adequate capacity to accommodate future students due to cumulative development.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
<td>LTS</td>
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<td>5.7-18 Project and Cumulative Increase Demand for Solid Waste Services. Project implementation would result in an increased demand for disposal of solid waste.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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### 5.7-19  Open Space Impacts

Several aspects of the proposed project may result in impacts related to pedestrian access, special status plants, and visual impacts on the existing open space owned by Marin County – both Old St. Hilary’s Open Space Preserve and Tiburon Uplands Preserve. Dedication of Parcel A and Parcel B as public open space would increase the land management burden for the Marin County Open Space District, or another public land management agency, by increasing demands for management of Parcels A and B and constraining the land management agency’s ability to manage existing open space.

Mitigation Measures 5.1-7, 5.6-1, and 5.8-1 would be required to mitigate project impacts to the adjacent Marin County Open Space District’s open space.

- **5.7-19(a)** Requires development and implementation of an Open Space Management Plan for parcels A and B.

### 5.7-20  Increased Demand on Existing Parks and Open Space

Accelerated deterioration of public parks and open space, resulting from increased demand / use, could cause significant environmental impacts in maintaining acceptable service ratios for park, recreational, and open space facilities.

- **LTS** No mitigation would be required.

### 5.7-21  Cumulative Impacts on Existing Parks and Open Space

Development of the proposed 2008 Easton Point Residential Development along with other development along the Tiburon Peninsula could result in significant cumulative impacts on existing parks and open space.

- **LTS** No mitigation would be required.

### Visual Quality

**5.8-1 View from Tiburon Ridge (Viewpoint No. 1).** Development on the project site would be highly visible from the Old St. Hilary’s Open Space Preserve as illustrated by the Tiburon Ridge viewpoint. Because this is a public recreation area that offers outstanding scenic vistas and is immediately adjacent to the project site, views from the open space have a maximum level of sensitivity. Consequently, development on the project site would need to be invenid in order to avoid causing a significant change in visual quality. However, the project’s appearance would be dominant. In this view, implementation of the project as proposed would not substantially damage scenic resources, but would substantially affect a scenic vista and would substantially degrade the existing visual quality and visual character of the site.

#### Mitigation Measure

- **5.8-1** Requires the following measures as a condition of approval: revise the PDP, the project’s CC&Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project:
  - Limit building height to one story with a maximum of 18 feet on lots that would be visible from the Old St. Hilary’s Open Space Preserve in order to minimize view blockage the silhouetting of rooflines as seen from within the open space. A secondary impact of lower building heights would be a larger building footprint or a smaller house.
  - Locate buildings on Lot 24 and Lots 35 through 43 as far from the spine of Ridgeline C as possible. Locate buildings on Lots 10 through 19 as far from the spine of the Ridgeline.
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| • Limit chimney heights and widths to avoid their silhouette being seen against the sky or San Francisco Bay from within the open space.  
• Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from views from the open space and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that overplanting with trees in a formerly grassland landscape would itself create a significant, man-induced visual change. Additionally, fire regulations limit the proximity of plantings to homes and other structures. | D as possible. | |

5.8-2 View from Heathcliff Drive (Viewpoint No. 2). Development on the project site would be highly visible from the end of Heathcliff Drive as illustrated by the Heathcliff Drive viewpoint. Viewpoint No. 2 is at the end of a public street looking across the Old St. Hilary’s Open Space Preserve. The view has a maximum level of sensitivity. Therefore, development on the project site would need to be invident in order to avoid causing a significant change in visual quality. However, the proposed project would be a co-dominant feature of the scene. In this view, implementation of the project as proposed would not substantially damage scenic resources but would substantially affect a scenic vista and would substantially degrade the visual quality and visual character of the site. | S | 5.8-2 In order to mitigate impacts from this viewpoint, implement Mitigation Measure 5.8-1. | SU |
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<td>5.8-3  View from Paradise Drive (Viewpoint No. 3).</td>
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<td>5.8-3 Requires measures as a condition of approval: revise the PDP, the project’s CC&amp;Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project:</td>
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<td>• Locate the building on Lot 16 as far down the slope as possible and the building on Lot 15 as far to the northeast and down the slope as possible so that they do not appear to be on the top of Ridgeline D and their silhouette is not seen against the sky.</td>
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<td></td>
<td></td>
<td>• Limit chimney heights and widths to avoid their silhouette being seen against the sky.</td>
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<td>• Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from views from Paradise Drive and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that overplanting with trees in a formerly grassland landscape would itself create a significant, man-induced visual change.</td>
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<td>5.8-4 View from Ayala Cove on Angel Island (Viewpoint No. 4).</td>
<td>S</td>
<td>5.8-4 Requires incorporation of measures as a condition of approval: revise the PDP, the project’s CC&amp;Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project:</td>
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<td>Limit building height of homes seen as protruding above the ridgeline and against the sky to one story with a maximum of 18 feet. A secondary impact of lower building heights would be a larger building footprint or a smaller housing unit.</td>
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<td>Locate buildings on Lot 24 and Lots 35 through 43 as far from the spine of the Ridgeline C as possible. Locate buildings on Lots 10 through 19 as far from the spine of the Ridgeline D as possible.</td>
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<td>Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from view and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that over-planting with trees in a formerly grassland</td>
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### 2.0 Summary of Findings

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| 5.8-5 Landslide Repair. Proposed landslide repair on the project site would be accomplished primarily by subsurface methods, but would also employ some above-ground elements. Long-term visual evidence of landslide repair may persist and be recognizable as an unnatural alteration of the hillside. | S | 5.8-5 Requires incorporation of measures as conditions of approval in order to reduce the visual impact of the proposed landslide repair that includes:  
* Re-grading of areas where landslides are repaired by removal and replacement methods so that the finished grade mimics the contour of the area immediately adjacent and the surface of the treated area is not unduly uniform or has angular features. Replant or reseed, as appropriate, disturbed areas with species that existed prior to disturbance.  
* In areas where subsurface landslide repair is implemented, re-grade disturbed surfaces to match the original grade and replant or reseed, as appropriate, with species that existed prior to disturbance.  
* Place debris fences as far back from and as far above Paradise Drive as possible. Retain all vegetation between the road and the debris fence and in the area where the fence is installed so as to provide as much screening of the fence from the road as possible. Specify an appropriate dark color for debris fence material including posts and anchors that will minimize any color contrast with the immediate area where the fence will be installed. | LTS |
| 5.8-6 Light Pollution. Implementation of the proposed project would result in new lighting sources on the project site which could lead to increased light pollution. This would be a significant impact. | S | 5.8-6 Requires preparation of a lighting plan consisting of measures to minimize unnecessary illumination throughout the project site that will be incorporated into the Precise Development Plan. | LTS |
### Cultural Resources

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<td><strong>5.9-1 Potential Subsurface Resources.</strong> While no discernible impacts to archaeological resources or human remains are anticipated, the possibility cannot be precluded that prehistoric cultural deposits and features are present below the surface and could be damaged during land alteration activities.</td>
<td>S</td>
<td><strong>5.9-1</strong> Requires training of construction workers for recognition of archaeological resources and measures, in the event that archaeological resources are discovered, that allow for unimpeded evaluation by an archaeologist and consultation with appropriate agencies including the Native American groups and the Marin County Coroner (if skeletal remains are found).</td>
<td>LTS</td>
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<td><strong>5.9-2 Historic Significance of Spanish Trail.</strong> Spanish Trail does not appear to have existed during the Spanish or Mexican periods or to be eligible for inclusion on the California Register, despite its historical interest locally, and does meet CEQA definitions as an historical resource.</td>
<td>LTS</td>
<td>No mitigation would be required.</td>
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<td><strong>5.9-3 Historic Significance of Keil Cove.</strong> Changes to the hydrology of the site resulting from the project could reduce or eliminate the available water supply that recharges Keil Spring, a key feature of the Keil Cove property, and could reduce the groundwater inflow from upslope areas on the project site into the two Keil Cove cisterns (See Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply.) The spring water and the groundwater inflow provide the sources for water used to irrigate vegetation features that are a key feature of the Keil Cove property. Construction activities (see Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation) could result in erosion and downstream sedimentation that increase the risk of sedimentation to Keil Pond; Keil Pond is a key feature of the Keil Cove property. These effects have the potential to cause a substantial adverse change in the historical significance of the Keil Cove property due to: (1) the adverse material alteration or loss of Keil Spring, (2) the adverse material alteration or loss of vegetation features, and / or (3) the adverse material alteration of Keil Pond. The Keil Cove property is assumed to meet the CEQA definition of a historical resource (discretionary significance) for the purposes of evaluating cultural resources impacts for the Draft EIR. These effects would be significant historical resource impacts.</td>
<td>S</td>
<td><strong>5.9-3(a)</strong> Mitigation Measures 5.5-3(a), (b), and (c), designed to reduce impacts associated with potential erosion and downstream sedimentation that could impact sensitive off-site habitats, including Keil Pond, to a less-than-significant level, would also be required to reduce the physical impacts that downstream sedimentation would have on Keil Pond which is a key component of the Keil Cove property (an historical resource) to a less-than-significant level.</td>
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<td><strong>5.9-3(b)</strong> Mitigation Measure 5.5-6 is designed to reduce the project’s impact on groundwater supplies, Keil Spring and the Keil property spring-based water supply to a less-than-significant level would also be required to reduce impacts on the Keil Cove property (an historical resource) to a less-than-significant level.</td>
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### Impact

Distant views of some of the houses on the project site would be visible from the southern end of the east side of Keil Pond and on the adjacent path around the lake. The addition of these views of the houses would alter the existing setting of the Keil Cove property but would not result in a substantial adverse change to the setting of Keil Cove as a historical resource.

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<td>Distant views of some of the houses on the project site would be visible from the southern end</td>
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<td>of the east side of Keil Pond and on the adjacent path around the lake. The addition of these</td>
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<td>views of the houses would alter the existing setting of the Keil Cove property but would not</td>
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<td>result in a substantial adverse change to the setting of Keil Cove as a historical resource.</td>
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2.5 MAJOR EIR CONCLUSIONS AND ISSUES TO BE RESOLVED

The EIR reached the following major conclusions:

- As discussed in Section 5.1 Transportation, the Draft EIR concludes that the proposed project would not result in a significant increase in peak hour traffic volumes at all of the study intersections. The proposed project would contribute to peak hour cumulative impacts at the Avenida Miraflores / Tiburon Boulevard, Rock Hill Drive / Tiburon Boulevard intersections and the unsignalized Reed Ranch Road southbound left turn to Tiburon Boulevard. Project site residents would contribute to the number of bicyclists using Paradise Drive. Mitigation measures are proposed along Paradise Drive. Long-term project traffic to Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets would not result in significant impacts to existing or future road capacity. However, emergency access vehicles and residents of these existing neighborhoods would be exposed to more frequent unpredictable traffic flow and intermittent safety hazards when traveling on the narrow, winding residential streets. Mitigation measures are proposed for this impact. The proposed on-site streets would not meet Marin County standards and the applicant has requested an exception to the County standards. The Draft EIR recommends that the on-site roads be constructed in compliance with county standards. Construction of such roads would have minor secondary impacts related primarily to geology and soils, hydrology and water quality, and biological resources. The proposed project would create a demand for parking spaces. A mitigation measure is proposed to provide additional on-site parking to accommodate anticipated parking demands.

- As discussed in Section 5.2 Air Quality, construction activities could expose neighbors to unhealthy levels of particulate matter and possible toxic air contaminants. Grading of the project site may disturb soils containing serpentine, possibly releasing asbestos fibers into the air. With conformance to BAAQMD regulations and proposed mitigation measures, these impacts would be less-than-significant. Generation of greenhouse gas emissions would not exceed BAAQMD significance criteria.

- As discussed in Section 5.3 Noise, construction noise at the project site would temporarily increase ambient noise levels in the site vicinity. Measures are proposed to mitigate construction noise but this would be a significant unavoidable impact.

- As discussed in Section 5.4 Geology and Soils, a total of 28 landslides have been identified on the project site. Miller Pacific Engineering Group, the applicant’s geotechnical engineer, has proposed a conceptual landslide stabilization plan for the project site. Exhibit 5.4-2 describes the proposed landslide stabilization for the on-site landslides and Exhibit 5.4-3 illustrates the proposed landslide stabilization program. The Draft EIR found that the proposed landslide stabilization program would be adequate to protect proposed development improvements. However, other, landslides are located in proposed open space areas and on portions of proposed lots over 100 feet from proposed building / improvement sites. If all of the landslides are not improved, mitigated or avoided, some of the unrepaired landslides could reactivate, causing a potential risk to life and property. While the applicant’s geotechnical consultant’s conceptual landslide stabilization plan would improve the stability of much of the site, it would also leave undeveloped portions of the site vulnerable to future slope failures. CEQA analysis addresses the impact of the proposed project on the site conditions existing at the time the Notice of Preparation was published. Because the landslides on the project site are an existing condition, some existing landslide hazards may or may not be impacted by the proposed project. Existing landslide...
conditions that do not pose a hazard to the proposed project, including landslides that are not impacted by the project, do not require mitigation under CEQA. Marin County’s landslide mitigation policy requires landslide stabilization for all proposed project improvements and that the proposed project not exacerbate the existing conditions for other landslides located on the project site. The Miller Pacific landslide mitigation program for this project documents compliance with Marin County’s landslide policy.

- As discussed in Section 5.5 Hydrology and Water Quality, the project proposes the on-site detention of portions of the post-project stormwater runoff through the use of underground storage facilities. The storage facilities would use controls to release detained stormwater at pre-project discharge rates. The stormwater detention facilities would maintain pre-project ten-year peak flow rates under post-project land use conditions for the ten-year to 100-year design rainstorms. With use of the detention volumes calculated in the Draft EIR and with outlet controls appropriately sized to maintain detention facility outflows at the ten-year pre-project level, there should be no impact to the conveyance capacity of the culverts below Paradise Drive. The proposed project would result in significant impacts to on-site drainage patterns but less-than-significant impacts to groundwater recharge and on-site hydrology. Landslide repair or improvements required to stabilize existing landslide deposits would convert on-site groundwater to surface water. Together with the addition of impervious surface these impacts would reduce the available water supply to Keil Spring and the Keil Property spring-based water supply. Mitigation measures to reduce impacts to the Keil Spring and the Keil property spring-based water supply are recommended. Implementation of this mitigation would require the agreement and cooperation of the owners of the Keil property.

- As discussed in Section 5.6 Biological Resources of particular concern is the potential impact to two special status plants (the Marin dwarf flax and serpentine reed grass) and one special status animal (California red-legged frog). The proposed project would eliminate approximately 75 percent (1.68 acres) of habitat mapped in 2009 for the Marin dwarf flax and 75 percent (0.06 acre) of habitat mapped in 2009 for the serpentine reed grass on the project site. Mitigation measures are proposed to preserve on-site population of Marin dwarf flax and serpentine reed grass. The mitigation may, however, require the relocation or elimination of Lots 1 through 3. No suitable breeding habitat for the California red-legged frog exists on-site. The proposed project would, however, result in a significant impact to foraging habitat and dispersal movements for frogs which breed in Keil Pond. Mitigation requires the maintenance of a woodland corridor for the California red-legged frog in the Forest Glen Court area. The proposed project would also result in the loss of 9.72 acres of serpentine bunchgrass and between 7.9 and 12.8 acres of coast live oak woodland. The project would result in the loss of at least 742 trees, some of which would be considered ordinance-sized by Marin County. The project proposes to compensate for the removal of trees by planting of replacement trees on-site at a replacement:loss ratio of 3:1, 4:1, or 5:1 depending on the size of the tree. Even at the minimum 3:1 ratio this would result in the planting of over 2,000 replacement trees on-site. In the EIR biologist’s opinion, this would not be feasible as sufficient land area for replacement plantings is not available on-site. Alternative mitigation measures to compensate for tree removal are recommended in the biological resources section of the Draft EIR.

- Section 5.7 Public Services evaluates fire protection and emergency services, police services, water supply, wastewater management, energy, public schools, solid waste, and parks and recreation facilities. The Tiburon Fire Protection District has indicated the project site is located in an area where there is limited emergency radio coverage, resulting in inadequate communication capabilities for emergency personnel. Mitigation requires preparation of an
emergency radio coverage improvement plan prepared in cooperation with the Marin Emergency Radio Authority.

The proposed project includes construction of a new 180,000 gallon water supply tank and distribution lines within the project site. Due to constraints with the proposed water supply and distribution system and additional constraints with the existing water lines located under Paradise Drive, some homes would not have the standard water pressures required for domestic water service. Furthermore, as designed the proposed project would have houses located at elevations where, in relation to the elevation of the proposed water tank, the water pressure would not be adequate to provide minimum fire flow requirements. Mitigation is proposed for both domestic water pressure and fire flow impacts.

Several aspects of the proposed project may impact the existing open space owned by the Marin County Open Space District – both Old St. Hilary’s Open Space Preserve and Tiburon Uplands Preserve. These include pedestrian access impacts, impacts to special status plants, and visual impacts. The identified impacts to special status plants could be mitigated by a revised lot layout, but visual impacts would be significant unavoidable impacts.

- The Draft EIR evaluates visual impacts from four viewpoints – from Tiburon Ridge, from Heathcliff Drive, from Paradise Drive, and from Ayala Cove on Angel Island. As discussed in Section 5.8 Visual Quality, although mitigation measures are recommended, the Draft EIR concludes that the visual impact to the views from Tiburon Ridge, Heathcliff Drive, and Ayala Cove on Angel Island would be significant unavoidable impacts. Although not visible in the simulated view from Tiburon Ridge the 180,000 gallon water tank would be a highly conspicuous feature and would likely obstruct at least part of the view of Angel Island from other Tiburon Ridge viewpoints. Development on the project site, including the construction access road and the water tank, would be visible from locations on Angel Island, including Ayala Cove as shown in the simulated view. Long-term visual evidence of landslide repair may persist and be recognizable as an unnatural alteration of the hillside, resulting in a significant visual impact. Mitigation to reduce the visual impact of landslide repair to a less-than-significant levels is recommended.

- The focus of the analysis in Section 5.9 Cultural Resources is potential impacts to the off-site Keil Cove property. Based on available information the Keil Cove property appears to have the potential to meet the CEQA definition of a historic resource and is considered a historic resource for the purpose of evaluating cultural resource impacts in the Draft EIR. Due to the anticipated hydrological impacts that could reduce or eliminate the available water supply that recharges Keil Spring and reduce the groundwater flow to the Keil Cove cisterns the project would result in a significant impact to the historical source of irrigation water to the Keil Cove property. Mitigation measures are proposed to reduce the impacts to the Keil Cove property to a less-than-significant level.

- The Draft EIR evaluates an alternative location for the proposed water tank on the adjacent Old St. Hilary’s Open Space Preserve. The alternative site would be located approximately 150 feet northwest of the water tank site in the proposed project, along the same southeast-northwest trending ridgeline. The 180,000 gallon water tank would be buried underground. The most obvious visual impact benefit of the alternative water tank site would be the elimination of the above ground water tank. As discussed in Section 5.8 Visual Quality the proposed water tank would be a highly conspicuous feature of the project. Although the underground tank itself would not be in view other aspects, such as safety bollards at the edge of the area directly above the buried tank, grading required to create the access road to the tank site, and the access road itself would be visible. A relocated water tank would remain a significant unavoidable visual impact.
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3.0 DESCRIPTION OF THE PROPOSED PROJECT
3.0 DESCRIPTION OF THE PROPOSED PROJECT

This chapter of the Draft EIR identifies the location of the proposed 2008 Easton Point Residential Development project (the proposed project), and describes all of the proposed improvements and entitlements requested in the applications. This section also discusses existing land uses, land use designations, and zoning on the project site, and summarizes all aspects of the project as proposed. Furthermore this chapter identifies the administrative actions required by the planning and environmental review process before Marin County can make a decision on the proposed project.

3.1 SITE LOCATION AND LAND USES

Site Location

The 110-acre 2008 Easton Point Residential Development project site (APN 59-251-05) is located at the southeastern tip of the Tiburon Peninsula in unincorporated Marin County, about five miles southeast of the U.S. Highway 101 (U.S. 101) / Tiburon Boulevard interchange via Tiburon Boulevard and about eight miles from the U.S. 101 / Tamalpais Drive interchange via Paradise Drive (see Exhibit 3.0-1). The site is contiguous to the Town of Tiburon’s corporate boundary on the south and west where it also is adjacent to the Old Tiburon and Hill Haven residential neighborhoods (south), Old St. Hilary’s Open Space Preserve and Tiburon Uplands Nature Preserve (west), and Paradise Drive (north and east) (see Exhibit 3.0-2).

U.S. 101 provides north-south local and regional access in Marin County and to adjacent counties. Tiburon Boulevard, designated as State Route (SR) 131, provides access to the incorporated City of Belvedere and Town of Tiburon and the unincorporated Strawberry and Paradise Drive areas via the south side of the Tiburon Peninsula. Paradise Drive serves the north side of the Peninsula, including the Towns of Corte Madera (eastern part) and Tiburon (northern part) and unincorporated land. Trestle Glen Boulevard connects Tiburon Boulevard and Paradise Drive, and is the only paved roadway across the hilly spine of the Tiburon Peninsula.

The project site is the largest undeveloped private land holding in the Tiburon Planning Area. About half of Tiburon’s planning area consists of the incorporated Town. The remaining half consists of the unincorporated Paradise Drive South Sub-Area (where the site is located), Paradise Cay & Vicinity Sub-Area, and Strawberry / Ring Mountain Sub-Area.

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1 Previous environmental documents prepared for the Town of Tiburon in 1996 assessed the 110-acre project site and a second 15-acre parcel, located east of Paradise Drive along the shoreline of San Francisco Bay. The latter 15-acre parcel (APN 59-231-02) is now in a different ownership and is not part of the project examined in this EIR.

2 The Tiburon Planning Area consists of the incorporated Town of Tiburon, the unincorporated part of Paradise Drive, the unincorporated area between the western border of incorporated Tiburon and U.S. 101 north of Tiburon Boulevard, and all unincorporated portions of the Ring Mountain Open Space Preserve.
Exhibit 3.0-1
Regional Location

Source: TOPO! Wildflower Productions (USGS), 1999
Exhibit 3.0-2
Project Location

Source: TerraMetrics, 2009
3.0 Description of the Proposed Project

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Existing Land Use

PROJECT SITE

The project site consists of steep slopes and flatter ridges and is vegetated with dense coast live oak woodlands on lower elevations and grasslands on higher elevations, both punctuated by rock outcroppings. The site is undeveloped and virtually undisturbed except for some existing “social paths” that traverse the upper and lower portions of the property. The project site’s boundaries are fenced and posted with “no trespassing” signs. Unauthorized uses primarily appear to be recreational. The project site surrounds all or part of three in-holdings:

- A 0.77-acre parcel owned by the Marin Municipal Water District (MMWD), located uphill from Paradise Drive via a paved and gated 25-foot wide service road access easement, developed with the 1,000,000-gallon Paradise Water Tank (APN 59-251-04). The paved roadway is ten feet wide.
- The 0.51-acre Lands of Keil parcel, located within the project site. The parcel contains a spring connected by a pipeline to the Keil Cove property southeast of Paradise Drive (APN 59-251-02).
- The Chapman residence, a single-family home at 2641 Paradise Drive (APN 59-251-03).

SURROUNDING LAND USE

Adjacent land uses include private residential development, undeveloped public open space, and public facilities (roadways).

Residential Development

Town of Tiburon neighborhoods in the vicinity of the site include Lyford Cove / Old Tiburon and Hill Haven. Hill Haven is immediately contiguous on the south and is developed with single-family homes built on lots that are typically 20,000- to 25,000 square feet, however some larger lots are located in the neighborhood as well. A survey of house sizes shows that houses range from approximately 2,500- to 5,000-square feet, with more homes in the 3,000- to 4,000-square foot range. The higher density Lyford Cove / Old Tiburon neighborhood is located southeast of the site and is developed with one-, two-, and multi-unit structures on smaller lots that vary in size but are typically closer to 10,000 square feet than lots found in other nearby neighborhoods. A survey of house sizes in the Lyford

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3 As indicated by the description, “social paths” are those created by informal use, in the case of this site by trespass.
4 The MMWD also has a 15-foot wide, 170-foot long pipeline easement overland to Paradise Drive northeast of the tank.
5 There is a recorded easement in favor of the Lands of Keil for the right to convey water over the Easton Point project site. The pipeline route is not expressly described and is left to the discretion of the Easton Point property owner.
Cove / Old Tiburon neighborhood range from 1,500- to 4,500-square feet, with more homes in the 2,000- to 3,000- square foot range. Both neighborhoods are characterized by steep, narrow, and winding streets, four of which dead-end at the site boundary -- Mountain View Drive, Ridge Road, Spanish Trail Road, and Straits View Drive.

Another residential neighborhood within close proximity to the project site is located to the northwest, across Old St. Hilary’s Open Space Preserve, and is primarily accessed by Lyford Drive. Lot sizes range from approximately 15,000- to 40,000-square feet. In this neighborhood house sizes range from 2,500- to 7,500-square feet, with more house sizes in the middle of this size range.

Outside the Town of Tiburon, scattered large-lot residential development is located along Paradise Drive north and east of the site. One such property, the approximately 30-acre Keil Cove parcel (2600 Paradise Drive), is located across Paradise Drive from the site’s eastern boundary but obtains landscape irrigation water from the 0.51-acre Lands of Keil spring surrounded by the project site.

**Open Space**

The 120-acre Old St. Hilary’s Open Space Preserve is located along the site’s western boundary and consists of the former Harriman / Marinero and Jay / Terraces properties purchased by the Marin County Open Space District (MCOSD) and Town of Tiburon in 1997 and operated by the MCOSD. The 23-acre Tiburon Uplands Nature Preserve, located along the northwestern site boundary is owned and operated by the Marin County Department of Parks and Open Space.

**Public Facilities**

San Francisco State University’s marine and estuarine research facility, the Romberg Tiburon Center for Environmental Studies, is located at 3152 Paradise Drive. The 34-acre site includes a research building housing ten laboratories, the Keck Lab Classroom, faculty and student offices. Also located on the site is the Bay Conference Center which includes a 140-seat main hall for meeting or lectures plus additional facilities for meetings and conferences. The Ohrenschall Guest Center provides short-term overnight lodging for university guests, affiliates and Bay Conference Center conferees.

In addition to MMWD's Paradise Water Tank surrounded by the site, the Hill Haven Water Tank is located adjacent to the site’s southern boundary at the existing end of Ridge Road. It has a capacity of 160,000 gallons.

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7 Ibid.

8 Ibid.
**Land Use Designations and Zoning**

**MARIN COUNTYWIDE PLAN AND ZONING**

**Marin Countywide Plan**

The Marin Countywide Plan (CWP) land use designations for the Easton Point site are Planned Residential (PR) (one dwelling unit per one to ten acres) and Single Family 6 (SR6) (four to seven dwelling units per acre). The portion of the project site northeast of where Spanish Trail Road intersects the site is designated SF6 and the remainder of the site is designated PR. It is estimated that approximately 4.5 acres of the site is within the SF6 designation. The remainder of the site (approximately 105.5 acres) is within the PR designation. The number of housing units permitted on the PR designated lands would range from ten to 105. The number of housing units permitted on the SF6 designated lands would range from 18 to 31 units.

Approximately 70 acres of the project site is also located in the County’s Ridge and Upland Greenbelt Area. The CWP directs that a variety of strategies be used to protect views of Ridge and Upland Greenbelt areas. It is also stated that the density for Ridge and Upland Greenbelt subdivisions should be calculated at the lowest end of the CWP designation range.

**Marin Zoning Ordinance**

County zoning of the majority of the project site is RMP-0.2 (Residential, Multiple Planned, 0.2 units per acre). The RMP zoning district is intended for a full range of residential development types within the unincorporated urban areas of the County. Permitted uses in this district include single-family, two-family dwellings, multi-family residential development and limited commercial uses in a suburban setting.

A small portion of the project site (northeast of where Spanish Trail Road intersects the project site) is R1 (Residential, Single-family). The R1 zoning district is intended for areas suitable for single-family residential neighborhood development in a suburban setting, along with similar and related compatible uses. The minimum lot area in the R1 zoning district is 7,500 square feet.

An asterisk on the County’s zoning map refers to a note on the map that states “this zoning was modified by Court Order”. The Court Order refers to a U.S. District Court decision resulting from a 1975 lawsuit which determined that development of the project site with a minimum of 43 single-

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family residential units on minimum one-half acre lots would be consistent with the goals of the Marin Countywide Plan. 12

**TOWN OF TIBURON GENERAL PLAN**

The project site is located in unincorporated Marin County, within the Town of Tiburon’s Sphere of Influence. The proposed development application does not include annexation into the Town of Tiburon. Therefore, since the proposed development would remain within the jurisdiction of Marin County, the project will be required to conform with the Marin Countywide Plan and Marin County Development Code (Zoning Ordinance) and not Town of Tiburon regulations.

The information below regarding the Town of Tiburon General Plan is provided for informational purposes only.

The *Tiburon General Plan* 13 land use designation for the Easton Point project site is Planned Development – Residential (PD-R). The Easton Point property is not within the Town’s boundaries but is within the Town’s planning area, and therefore, has a *Tiburon General Plan* land use designation. The Easton Point property is one of several properties along Paradise Drive that is shown to be annexed to the Town of Tiburon prior to development. 14

As further discussed in **Chapter 6.0 Alternatives to the Proposed Project** on November 12, 2009 the Town of Tiburon and the Easton Point project applicant (the Martha Company) signed a Memorandum of Understanding (MOU) regarding a 32-Unit Lower Density Alternative (LDA) for the project site. As a part of the MOU the Town stated it will support annexation of the project site into a public sanitary district. Furthermore, at its discretion the Town will enter into a deferred annexation agreement to permit annexation of the project site into the public sanitary district prior to annexation into the Town.

The Land Use Element of the *Tiburon General Plan* provides a description of the properties with a PD-R designation, including the Easton Point property. 15

As noted in the Land Use Element, at 110 acres the Easton Point property is the largest private landholding in the Planning Area. The site consists of steep slopes and flatter ridges covered by dense coast live oak woodlands on lower elevations and grasslands on higher elevations, both punctuated by rock outcroppings. Seven significant ridgelines exist on the property, along with numerous landslide areas. Previous environmental documents prepared for the Town indicate that the maximum density is

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14 *Town of Tiburon General Plan*, op. cit., Figure 2.5-1 Annexation Areas

15 *Town of Tiburon General Plan*, Land Use Element, op. cit., pages 2-5 through 2-10.
3.0 Description of the Proposed Project

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not likely to be achieved. The maximum allowable density is identified as 0.4 housing units per one acre.\(^{16}\) The maximum number of housing units is 44.

The Open Space & Conservation Element of the \textit{Tiburon General Plan} includes prime open space policies that describe which open space is valuable to the community. Prime open space characteristics identified for the Easton Point property by the \textit{Tiburon General Plan} include significant ridgelines, wetlands, streams and riparian corridors, special status species / special communities, steep slopes (greater than 40 percent), inboard/outboard views, and tree stands.

Because the Easton Point property is not within the Town boundaries, the property does not have a Town zoning designation. In July 2009 the Town prezoned the project site to the Town’s RPD-0.4 zoning designation.\(^{17}\)

The project’s relationship to specific policies of the \textit{CWP} and provisions of the County’s Development Code are discussed in \textit{Chapter 4.0 Relationship to Public Plans}.

\section*{3.2 PROJECT DESCRIPTION\(^{18}\)}

The Martha Company, a family holding company, has submitted an application to Marin County for approval of the \textit{2008 Easton Point Residential Development} project.

The applicant’s objectives are listed below, followed by a full description of all aspects of the submitted applications.

\textbf{Project Objectives and Goals}

The project applicant submitted the following project objectives and goals to Marin County for the proposed \textit{2008 Easton Point Residential Development} project.

\textbf{OBJECTIVES}

- Preserve the scenic beauty of the Martha Company property at Easton Point while developing a residential development consistent with the \textit{Judgment Pursuant to Stipulation} of the United States District Court for the Northern District of California, filed November 7, 2007, in \textit{County of Marin v. Martha Co. et al.} as well as the \textit{Judgment Pursuant to Stipulation} of the United States District Court for the Northern District of California, filed December 29, 1976 in \textit{Martha Co. v. County of Marin}.

\(^{16}\) This is equivalent to one housing unit per 2.5 acres.

\(^{17}\) Town of Tiburon Ordinance No. 516 N.S. An Ordinance of the Town Council of the Town of Tiburon Prezoning Unincorporated Territory in the Paradise Drive Area of the Tiburon Planning Area, adopted July 1, 2009.

\(^{18}\) The project description is based on application materials submitted by the project applicant. See \textit{Section 1.5 Information Used to Prepare the Draft EIR} for a description of the application materials.
• Obtain approvals for:

A Master Plan permitting development of 43 single-family homes.

A Tentative Subdivision Map for 43 residential lots, and three parcels to be deeded to public agencies.

A Precise Development Plan which allows the necessary infrastructure development to implement the Master Plan and Tentative Map.

• Through the approval process obtain guidelines for future development of residences and accessory uses.

• Ensure that development:

  Is sensitive to the property’s unique natural resources;

  Respects the public interest in land conservation;

  Appropriately balances the public’s desire to leave large parts of the land open and undeveloped with the owner’s need for a reasonable economic return on the property; and

  Creates the necessary public infrastructure improvements to protect health and safety.

**GOALS**

• Find a way to inhabit this magnificent natural resource without destroying the very reason people are drawn to the site.

• Provide an orderly balance of private and public use.

• Ensure that development is consistent with environmental constraints and the ability of the land to support such uses.

• Embody simplicity by nestling housing on and in the ground with a similarity of material, color, and form that links residences to each other and to their surroundings.

• Preserve existing neighborhood character and identity by careful coordination of new development with adjacent neighbors and by creation of greenbelt buffer zones between new and existing development.

**Project Related Applications**

The proposed 2008 Easton Point Residential Development will require the following approvals from Marin County:

• Rezone the project site from Single Family Residential (R-1) and Residential Multiple Planned District (RMP-0.2) to Residential, Single Family Planned (RSP).
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• Master Plan approval
• Precise Development Plan (Phase One) approval
• Tentative and Final Subdivision Map approval
• Design Review approval for construction of future homes on individual lots
• Exception to Marin County Subdivision Standards (an exception is requested to Title 24, Development Standards, Section 24.04.110 (width))
• Grading Permit(s)
• Building Permit(s)

Master Plan

The applicant proposes to create 43 residential lots for development of detached single family homes on 49.61 acres of the project site. In addition, two parcels (Parcel A 59.60 acres and Parcel B 0.33 acres) would be offered for dedication to the Marin County Open Space District. Parcel B is proposed as a Marin dwarf flax (a special status-plant species) preserve. A 180,000-gallon concrete water tank would be constructed on Parcel C (0.25 acres) and conveyed to the Marin Municipal Water District. The applicant proposes to construct roads and utilities to serve each of the 43 residential lots. The applicant also proposes to remediate or repair some landslides on-site to accommodate proposed development. Individual homes would be developed by future owners of residential lots. Exhibit 3.0-3 summarizes proposed land uses and Exhibit 3.0-4 illustrates the Master Plan site plan.

Exhibit 3.0-3
Summary of Land Uses

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<thead>
<tr>
<th>Land Use</th>
<th>Acreage</th>
<th>Square Feet</th>
<th>Percent of Site</th>
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</thead>
<tbody>
<tr>
<td>Open Space Parcels</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Parcel A</td>
<td>59.60</td>
<td>2,596,001</td>
<td>54.3</td>
</tr>
<tr>
<td>Parcel B</td>
<td>0.33</td>
<td>14,170</td>
<td>0.3</td>
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<td>59.92</td>
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<td>54.6</td>
</tr>
<tr>
<td>Water Tank (Parcel C)</td>
<td>0.25</td>
<td>11,014</td>
<td>0.2</td>
</tr>
<tr>
<td>Residential Lots</td>
<td>49.61</td>
<td>2,160,953</td>
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<tr>
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<td><strong>109.78</strong></td>
<td><strong>4,782,138</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

RESIDENTIAL LOTS

The 49.61 acres devoted to residential lots would account for 45 percent of the entire site. Individual lots would range in size from 0.55 (Lot 43) to 2.25 acres (Lot 6), for an average size of 1.1 acres per lot. The 43-lot project has a gross density of one housing unit per 2.55 acres considering the entire 110-acre site area; and a net density of one housing unit per 1.15 acres within the 49.61-acre proposed residential development area.

Residential lots are proposed in the following areas:

- Thirty (30) lots contiguous to the Hill Haven neighborhood, with access via Mountain View Drive to proposed Lots 1 through 3 and via Ridge Road to proposed Lots 4 through 20, 24, 35 through 43.
- Three (3) lots on Paradise Drive, with access via a new shared driveway off Paradise Drive to proposed Lots 21 through 23 adjacent to Old Tiburon at the existing Town boundary.
- Ten (10) lots off Paradise Drive near MMWD’s Paradise Water Tank, with access via Forest Glen Court, a new road generally following the existing water tank service road alignment, to proposed Lots 25 through 34.

Each residential lot would include a building site (shaded on Exhibit 3.0-4). The building site would include each lot’s residence. Conceptual building footprints are shown for each building site on Exhibit 3.0-4. The building footprint locations are illustrative only, provided to demonstrate that buildings of the proposed size (see Exhibit 3.0-5) would fit within the proposed building site for each lot. In addition, it is the intent that all development, including patios, pools, gardening sheds, etc., would be contained within the shaded building area.

Exhibit 3.0-5 shows the size of each of the 43 residential lots along with the proposed maximum house size and building footprint for each lot. The maximum house would range in size from 5,000 square feet (Lot 29) to 8,750 square feet (Lots 10 to 12, 15, 20 to 24, 30, 37, and 38). The footprints would range in size from 2,500 square feet (Lots 1, 33, 34, 36, and 43) to 4,050 square feet (Lot 30).

PUBLIC OPEN SPACE AND TRAILS

The applicant is offering two open space parcels, Parcel A (59.6 acres) and Parcel B (0.33 acres), for dedication to the Marin County Open Space District. Parcel A would be to provide a direct open space link between Paradise Drive and both the Old St. Hilary’s Open Space Preserve and the Tiburon Uplands Nature Preserve. Parcel A would also provide a greenbelt buffer between parts of the Hill Haven neighborhood and the proposed 2008 Easton Point Residential Development.

Under the dedication proposal the Easton Point Property Owners’ Association would retain four easements across Parcel A:

- A drainage easement;

\[19 \text{ Residential acreage (49.61 acres) divided by lots (43) } = 1.15 \text{ acres / lot (1.1 acres, rounded).}\]
• An easement for the construction, use, and maintenance of a temporary construction access road, which is proposed to remain as a permanent emergency egress route;

• An easement for the planting of replacement trees for trees removed due to project construction. The species of such replacement trees would be designated by the Marin County Open Space District from a list of species determined appropriate for planting by the Marin Community Development Agency-Planning Division or future Design Review; and

• An easement to undertake any future work required for health and safety, including landslide stabilization and – to the extent that the Marin County Open Space District fails to maintain vegetation on Parcel A in accord with any future local, county, and state fire safety standards – the ability to cut or clear vegetation in accord with such future fire safety requirements.

Parcel B is proposed for the protection of the Marin dwarf flax. No public access is proposed for Parcel B.

A public pedestrian access easement is proposed along a portion of Ridge Road, up to Mt. Tiburon Court, and along Mt. Tiburon Court to provide access from the Hill Haven neighborhood to the existing adjacent public open space (Old St. Hilary’s Open Space Preserve and the Tiburon Uplands Nature Preserve). The proposed access easement would also provide access to Parcel A.
## Exhibit 3.0-5
### Residential Lot Summary

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Acreage</th>
<th>Square Feet a</th>
<th>Maximum House Size</th>
<th>Footprint (Site Plan)</th>
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a Rounded to the nearest square foot.

Source:  *Easton Point - Project Narrative*, Project Applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009.
Precise Development Plan

The proposed phase one Precise Development Plan (PDP) is limited to the construction and development of the necessary infrastructure to support the proposed 43-residential unit subdivision. The PDP does not include specific house designs, nor does the applicant seek Design Review at this time. However, PDP / Design Review approval would be required for each future home before a building permit would be issued for home construction.

ARCHITECTURAL DESIGN CONCEPT AND GUIDELINES

The PDP application includes applicant-proposed Architectural and Landscape Design Guidelines (Design Guidelines). The Design Guidelines would be incorporated into the proposed Conditions, Covenants and Restrictions for the lots in the project. The Design Guidelines would be used by the Property Owner’s Association and if approved by the County of Marin to guide the future required Design Review for the individual lots in the project. The design for each house would be subject to review and approval by both the Property Owners’ Association and Marin County through its design review process. Some of the proposed Design Guidelines are different from standards and definitions contained in the Marin County Development Code and if adopted would supersede the relevant standards and definitions in the Development Code. The proposed Design Guidelines are summarized below:

Sustainable Design

It is proposed that all buildings should incorporate sustainable design features into the design of the individual houses. These design features would include:

- Passive solar design.
- Active solar energy where neighbors are not unreasonably affected.
- Geothermal energy
- Energy conservation design.
- Use of recycled or recyclable building materials.
- Prohibition on wood-burning stoves or fireplaces that do not incorporate state-of-the-art engineering measures designed to prevent release of particulate matter.

Building Bulk, Mass, and Scale

Exhibit 3.0-5 shows the proposed maximum house size and building footprint for each lot.

- Proposed maximum house size for each lot is defined as all habitable floor area. This calculation is the sum of the gross horizontal areas of all floors, measured from the faces of exterior walls.

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20 Architectural and Landscape Design Guidelines for Easton Point, Easton Point – Project Narrative, applicant, 2008, Revision 2 in Response to Comments, received by Marin CDA 3-30-2009, Appendix D.
and excluding decks, courts, terraces, porches, and any detached structures not designed for or used for sleeping purposes.

- Proposed maximum lot coverage (footprint) is the total footprint for all building improvements, including but not limited to the house, garage, guest house, storage shed, pool cabana, arbor, and decks that exceed three feet above finished grade.

**Building Heights**

Single-story and two-story houses are proposed. Residential building heights would be restricted depending on lot location.

- Lots accessed through Hill Haven neighborhood. Homes should not exceed a maximum of 25 feet in height, as measured from grade. The majority of the building should not exceed 20 feet from natural grade. Accessory structures should not exceed 15 feet in height above natural grade.

- Lots accessed from Paradise Drive. In order to minimize building footprints two-story homes would be encouraged. Homes should be a maximum of 30 feet in height, as measured from natural grade to the top of the highest roof ridge. Accessory structures should not exceed 15 feet above natural grade.

**Viewshed Protection**

As discussed above, a building site and a building footprint for each residential lot is shown on the proposed Master Plan (see Exhibit 3.0-4). The project application states that the Master Plan creates a rebuttable presumption that a home of that lot coverage and shape will be permitted on each lot within the building footprint shown. The intent is that each lot owner would be cognizant of the construction that would likely be permitted on adjacent lots and should accordingly plan his / her own windows and view corridors in order to preserve privacy and views even after buildout of adjacent lots.

It is proposed that under specific circumstances lot owners would be permitted to build outside of the designated footprint if they meet certain conditions. Such a lot owner would need to demonstrate that the proposed residence would avoid highly visible areas, minimize interference with existing views on surrounding properties and demonstrate that other lot owners and public trail uses would not be significantly disadvantaged by the building location.

**Hillside Building Design**

Buildings situated in hillside areas should be designed to visually blend with the surrounding topography to minimize the prominence of structural height, bulk, and massing as viewed from surrounding properties and roadways. The following design criteria are proposed for building on a hillside:

- General building form should include low profile one- and two-story levels stepped down hillsides to conform to the surrounding natural terrain.

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21 As a legal term, a rebuttable presumption is an assumption made by a court, one that is taken to be true unless someone comes forward to contest it and prove otherwise.
• Uphill views of homes should present a low-slung horizontal silhouette by integrating deck and foundation design into the shape of the building and site topography.

• Downhill views of homes should present a pleasing roof-scape of low-pitched and gabled and hip roofs.

**Exterior Lighting**

It is proposed that exterior lighting be limited to the minimum amount necessary to safely illuminate points of access and outdoor living areas. Exterior lighting should generally be avoided in areas which are visible from surrounding properties and roadways, unless necessary for safety or security.

Night lighting for recreational use of tennis courts, sports courts, and other similar outdoor recreational activity areas would be prohibited to avoid glare and noise intrusion from nighttime use of such areas. In areas where lighting would be visible from roadways or surrounding properties, light fixtures should be mounted at low elevations and fully shielded to direct lighting downward to immediate area underneath the fixture.

**Exterior Building Materials and Colors**

Exterior building facades should be treated with materials and colors which visually blend with the surrounding environment, minimize contrast with the natural backdrop when viewed from off-site locations, minimize glare, and are fire resistant.

**Fencing**

No fencing of lot boundaries would be permitted, but low fencing to safeguard children and pets in proximity to the home would be allowed. All fencing locations, material, and design would be subject to Design Review. When planned, fences should generally not exceed five feet in height.

**LANDSCAPE DESIGN CONCEPT AND GUIDELINES**

It is proposed that landscaping respect the primary viewsheds available to surrounding residents and to users of the public open space. The location and species of new landscaping would be regulated by the Property Owner’s Association to ensure that existing scenic views would be preserved. On-site landscaping would utilize primarily native plant species which are compatible with the surrounding natural environment of the project site. Existing trees and natural vegetation would be retained where possible. Introduced landscaping would include 80 percent California native species tolerant to drought, fire, and frost which are consistent with plants approved by the Marin Municipal Water District. Trees and other vegetation endemic to mixed evergreen forest and open grass lands would be encouraged in landscape plans. The use of invasive species would be prohibited, including those listed in the State’s noxious Weed List, the California Invasive Plant Council’s list of *Exotic Pest Plants of Greatest Ecological Concern in California* and other priority invasive species as identified by the agricultural commissioner and California Department of Agriculture.

The PDP includes a conceptual landscape plan, consistent with the proposed guidelines, for the proposed project and provides a sample landscape design for two typical building sites (Lot 19 and

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Lot 28). A list of typical plants consistent with the proposed guideline, and a list of prohibited plants, is also provided.

**Urban-Wildland Interface Restrictions**

It is proposed that a Fuel Modification and Landscape Management Plan be included in the Covenants, Conditions and Restrictions (CC&Rs). This plan will inform property owners that they are responsible on an on-going basis for reducing flammable vegetation and debris, not only within their own fuel modification zones but also within any area of their property that may fall within a fuel modification zone for a neighboring structure. The following standards are proposed:

- **Home Ignition Zone** (the home plus ten feet) – Only small shrubs and small ornamental trees (spread out) would be allowed. No dead or dry grass or brush, shrubs, or trees would be permitted.

- **Defensible Space Zone** (11 to 50 feet) – Regular trees would be allowed, but spaced very far apart and limbed up ten feet or one-third of their live crown height, whichever is greater. No dead or dry grass, brush, shrubs, or trees would be permitted.

- **Wildland Fuel Reduction Zone** (50 to 100 feet) – All undergrowth must be removed, densely crowed smaller trees must be thinned out, and mature trees must be limbed up as in the Defensible Space Zone.

**Tree Loss**

The application includes an estimate of the number of trees to be removed from each proposed lot. Trees to be removed as part of the fire defensible space plan and due to tentative map improvements are identified. It is estimated that 742 trees would be removed due to individual lot development, Urban Wildlife Interface regulations, and landslide stabilization. Exhibit 3.0-6 provides a summary of tree loss due to site development.

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23 Ibid., Sheets L-2 and L-3.


25 Summary of Tree Tables, Easton Point Tree Tables, 2008, project applicant, revised April 21, 2009.
Exhibit 3.0-6
Estimated Tree Removal

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<thead>
<tr>
<th>Location</th>
<th>Number of Trees Removed</th>
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<tr>
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<td>Construction Access Road</td>
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<tr>
<td><strong>Total Number of Trees to be Removed</strong></td>
<td><strong>742</strong></td>
</tr>
</tbody>
</table>

Source: *Easton Point - Project Narrative*, Easton Point Tree Tables, Project Applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009.

To mitigate for the loss of trees the applicant proposes the following:

- During the Design Review stage, each applicant must identify the location and protection zone for every major tree affected. Building footprints may be adjusted to minimize removal of native trees.

- Lost trees would be replaced with over-story species (native oaks, bay and madrones) and understory species typical of the impact zone (such as toyon and ceanothus).

- Lost native trees would be replaced at the following ratios:

  - 3:1 for oak, bay, redwood trees six inches at breast height.
  - 4:1 for oak, bay, redwood trees seven to 12 inches at breast height.
  - 5:1 for oak, bay, redwood trees greater than 12 inches at breast height.

- When trees would be lost, during the Design Review for each house it would be necessary to identify appropriate restoration sites within Parcel A.

**ENFORCEMENT OF ARCHITECTURAL AND LANDSCAPE DESIGN RESTRICTIONS**

As a part of the project, the applicant proposes to establish a Property Owners’ Association (POA) and a declaration of Covenants, Conditions and Restrictions (CC&Rs). The Easton Point Property Owner’s Association would have long-term responsibility for administering and enforcing the deed restrictions contained in the CC&Rs concerning architectural and landscape design.

Membership in the POA would be mandatory with the purchase of a residential lot and would involve payment of fees to operate the POA. The CC&Rs would impose legally-binding commitments on residential lot owners and would be a perpetual part of the property deed, transferred with the sale and
resale of the property. A POA Design Review committee would review plans and be advisory to County Design Review. The POA Design Review committee would not supersede or substitute for the County’s design review and approval authority.

CIRCULATION

Site access would be provided by extensions of some existing streets and construction of new roads, as follows:

- **Mountain View Drive** would be extended from the cul-de-sac within the Hill Haven neighborhood as a 16-foot wide driveway to serve proposed Lots 1 through 3.

- **Ridge Road** would be extended for a distance of about 1,400 feet as a 20-foot wide paved roadway within a 40-foot wide roadway and utility easement and would terminate in a cul-de-sac (the roadway would be 24-foot wide at the entry to the cul-de-sac). It would serve proposed Lots 4 and 5 and 10 through 20 directly and also would serve proposed Lots 7 through 10 indirectly via a 400 foot long shared driveway. The driveway would start as 16-foot wide but would reduce to 12-foot wide after Lot 7. Lot 6 would be served by a driveway off of Ridge Road.

- **Mt. Tiburon Court** would be a new 20-foot wide paved roadway off of the extension to Ridge Road. It would serve proposed Lot 24 and Lots 35 through 43. A 12-foot wide driveway would extend from the end of Mt. Tiburon Court to the proposed water tank.

- **A new 16-foot wide paved driveway off of Paradise Drive** would provide access to proposed Lots 21 through 23. It would narrow to 12-foot wide after Lot 21.

- **Forest Glen Court** would intersect Paradise Drive at the present location of the existing MMWD water tank service road and would generally follow the alignment of (but would replace) the 25-foot wide service road for a distance of about 800 feet. The new 20-foot wide paved roadway within a 40-foot wide roadway and utility easement would serve Lots 25 through 34. Forest Glen Court would terminate in a cul-de-sac (the roadway would be 24-foot wide at the entry to the cul-de-sac).

- **A construction access road** would be constructed from the terminus of Forest Glen Court to the terminus of Mt. Tiburon Court. The construction access road would be ten feet wide with turnouts and paved with grooved concrete. After construction, it is proposed that this road remain for emergency egress only and would be blocked at either end by a barricade gate.

The applicant is not proposing to dedicate the new roadways to Marin County. Rather, the new roadways would be private roads and maintained by the Property Owners’ Association.

The Marin County Code (MCC) provides minimum standards for street widths. The minimum paved width for minor residential roads is 28 feet. For the proposed project this width would apply to Mt. Tiburon Road, Ridge Road, and Forest Glen Court. The PDP proposes narrower roads than the design standards in the MCC. As discussed above, Mt. Tiburon Road, Ridge Road, and Forest Glen Court would have a 20-foot wide paved roadway. It would be necessary for the project applicant to

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26  Marin County Code, Marin County Board of Supervisors, Section 24.04.110 (width).
receive an exception to the County standards for the proposed road widths. The MCC does provide procedures for exceptions to the standards and the applicant has requested the exceptions. 27

Road Grades

Roadway segments (including driveways) would have grades of up to 18 percent (see Exhibit 3.0-7). The temporary construction access road, however, would have a maximum grade of 25 percent. 28

Exhibit 3.0-7
Road Grades

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<th>Roadway / Driveway</th>
<th>Maximum Grade (percent)</th>
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<tr>
<td>Ridge Road</td>
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<td>Mt. Tiburon Court a</td>
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<tr>
<td>Lots 1 to 3 Driveway</td>
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<td>Lots 5 to 6 Driveway</td>
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<td>Lots 7 to 9 Driveway</td>
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<td>Construction Access Road</td>
<td>25</td>
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</table>

a. Driveway to water tank has a maximum grade of 17 percent.


Parking

Each residential lot would be provided with a minimum of four off-street parking spaces, two of which would be in a garage.

Off-Site Improvements

As a part of the proposed project the applicant intends to provide a number of off-site traffic improvements including the following:

- Improve the Forest Glen Court / Paradise Drive intersection to provide a minimum of 150 feet of sight distance in both directions for outbound vehicles.

27 Ibid., Chapter 24.15 Exceptions.

28 The 25 percent maximum grade would exceed the maximum grade permitted in the Marin County Code, section 24.04.120 (grades).
• Post signs prohibiting parking along both sides of Diviso Street and along other residential streets in the Hill Haven and Old Tiburon neighborhoods narrower than 20 feet wide (Town of Tiburon authorization required).

• Provide stop or yield sign control for the side streets intersecting Ridge Road (Town of Tiburon authorization required).

• Widen the Paradise Drive roadway to include four-foot shoulders with 60-foot tapers at the driveway for Lots 21 through 23 and the proposed Forest Glen Court intersection.

PUBLIC FACILITIES AND UTILITIES

The PDP includes a Utility Plan. Project implementation would involve the extension and installation of on-site water facilities, sewer facilities, and other utilities (gas, electricity, telephone, cable television) and on-site installation of drainage facilities. Proposed public facilities would be connected to those of the Marin Municipal Water District (MMWD) and Sanitary District No. 5. The PDP Utility Plan shows the location of proposed on-site street lights. All utilities would be constructed underground.

Water

The PDP proposes construction of a new 180,000 gallon water tank on a 0.25 acre parcel (Parcel C) adjacent to the Old St. Hilary’s Open Space Preserve. The new tank would have a pad elevation of 580 feet be 20 feet tall and 40 feet in diameter (see Exhibit 3.0-8). The new tank would connect to the existing 160,000-gallon Hill Haven Water Tank located at the present end of Ridge Road.

The existing 12-inch water line serving the 1,000,000-gallon Paradise Water Tank would be relocated along the alignment of Forest Glen Court. A new pump station would be constructed at the existing water tank to serve the proposed 180,000 gallon tank on Parcel C.

New water distribution pipelines would be constructed to serve the proposed 43 lots. In general Lots 1 through 20, 24, and 35 through 43 would be served by new water lines connected to the proposed new water tank on Parcel C.

Lots 21 through 23 would be served by a new water line connected to the existing water line in Paradise Drive.

Lots 25 through 34 would be served by a relocated water line in Forest Glen Court.

The PDP Utility Plan also shows future location of fire hydrants.

Sewer

The PDP proposes construction of an approximately 4,800-foot long four inch diameter sanitary sewer force main in Paradise Drive from Forest Glen Court to approximately 800 feet south of the southern project boundary, where it would connect with existing sewer lines maintained by Sanitary District No. 5. All sewage from the project would be conveyed to this sanitary sewer force main in Paradise

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Drive. The PDP does not propose to utilize existing sanitary sewer facilities located in the Hill Haven neighborhood.

In addition, a network of sanitary sewer force mains of varying diameters would be constructed within the site to serve the project site.

**Drainage**

The PDP includes a Grading and Drainage Plan 30 plus a Stormwater Control Plan. 31 The proposed drainage plan is intended to detain increases in storm water runoff on-site so there would be no increase in peak period storm water flows from the site for events greater than the ten-year storm. The Grading Plan proposes the construction of roads with curb and gutter systems that would direct runoff to catch basins leading to detention facilities. Each detention facility would be designed to maintain pre-project ten-year peak flow rates under post-project land use conditions for the ten-year to 100-year design rainstorms. The Drainage Report 32 provides documentation for design of the detention facilities. Included in the Drainage Report is a detention facility sizing routine for future home development. The design of residential detention systems would occur during the Design Review process for each lot. Discharge for the detention facilities would be directed to a level spreader, infiltration trench, bubble-up box, or rip rap pad. Where appropriate site conditions exist, detention facility discharge would outlet onto hillslopes for further treatment via vegetation and soil filtering, prior to reaching site drainageways. In instances where geotechnical concerns would not permit release of stormwater onto hillslopes, detention facility discharge would be conveyed to site drainageways. Drainageway flows would be conveyed to culvert crossings under Paradise Drive and would continue downslope and off-site toward their respective outlets in North San Francisco Bay. None of the existing Paradise Drive culverts handling runoff from the project site are proposed for replacement as part of the proposed project.

The pre-project and post-project watershed boundaries depicted in the Drainage Report appendices indicate that there would be minor locations of cross-watershed runoff transfers. The cross-watershed transfers would be a result of the proposed roadway grading, rather than mass hillslope grading. Catch basins and outfalls would not be spaced to capture and release stormwater within existing watersheds. Rather, they would be spaced such that after site grading, rainfall that falls within an existing watershed boundary may be conveyed as surface flow across a watershed boundary prior to being collected in a catch basin and directed to a hillslope or drainageway outfall.

Site roadway drainage design also includes the incorporation of filtration systems at each catch basin. The filtration systems look like tradition stormwater catch basins. These systems are an at-the-source treatment strategy, also known as low-impact development (LID) technology, designed for high pollutant removal efficiency via the use of a plant/soil/microbe treatment media. Lot roof and impervious surface runoff would also be treated using LID techniques by directing runoff to bioretention areas for treatment prior to entering detention vaults or being released into site

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30 *Grading and Drainage Plan, Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C1A, and C-1B, op. cit.*

31 *Stormwater Control Plan, Master Plan / Precise Development Plan / Tentative Map, Sheet C-2, op. cit.*

Erosion Control

The Stormwater Control Plan presents locations of best management practices (BMPs) for erosion control. The Stormwater Control Plan shows the locations of storm drain inlet protection, silt control devices and jute netting for slope protection, and also includes notes describing additional means of protecting water quality by use of LID measures.

LANDSLIDE REPAIR

The project site is mapped as being underlain by 28 landslides (Landslides 1 through 23, 26, 27, 38 through 40). Exhibit 3.0-9 shows the location of the landslides on the project site.

As a part of the preparation of the preliminary geotechnical report the project’s geotechnical consultant Miller Pacific Engineering Group (Miller Pacific) prepared a landslide mitigation policy for the 2008 Easton Point Residential Development project. Miller Pacific’s policy is described below:

Landslides that have a higher potential to affect existing or proposed improvements (Risk Level A landslides) will be improved or repaired. Portions of Risk Level A landslides or debris flow source areas within 100 feet of a building site or planned public improvement will be repaired. Landslide improvement (i.e. diversion structure, protective barriers and/or subsurface drainage) will be provided for landslide flow paths that cross the building site, or portions of Risk Level A landslides that could potentially impact existing off-site public improvements (i.e. Paradise Drive). Landslides with a lower potential to affect existing or proposed improvements (Risk Level B landslides) will be avoided or improved. Risk Level B landslides include active, dormant, or potential landslide areas on the property that do not have the potential to significantly damage property or improvements within or outside the property. In most instances, Risk Level B landslides are located in proposed undeveloped or open space areas.

Landslide Repair – Miller Pacific’s proposed landslide repair program would improve the stability of portions of landslides within 100 feet of the building site and proposed public improvements such that the calculated factor of safety is at least 1.5 for static conditions and greater than 1.0 for pseudo-static (seismic) conditions. The improved stability may be accomplished by various methods including: (1) excavation of unstable material, installation of subsurface drainage and construction of a compacted earth fill buttress; (2) design and construction of retaining structures; (3) de-watering with subsurface drainage; (4) removal of the entire unstable landslide mass; or (5) other methods acceptable to Marin County. Within a potential debris flow path, provide a protective catchment structure to

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34 As discussed in this chapter, each residential lot would include a building site (see Exhibit 3.0-4). All development (residence, patios, pools, gardening sheds, etc.) would be contained within the building site.

35 The factor of safety is defined as the ratio of the resisting forces to the driving forces. Slopes with a factor of safety less than 1.0 are unstable. The higher the factor of safety, the more stable the slope. For pseudo-static analyses, the ground acceleration determined from deterministic methods or the probabilistic ground acceleration that corresponds with a 10 percent chance of being exceeded in 50 years.
catch or slow a debris flow and reduce the potential to significantly impact building sites or off-site improvements.

**Landslide Avoidance** - Requires locating structures and improvements an adequate distance from an existing landslide so that any future movement of the landslide would not likely affect the structures or improvements.

**Landslide Improvement** - Maintain or improve the stability of portions of existing landslides more than 100 feet from the proposed building sites and proposed on-site public improvements. Improvement also includes efforts to maintain or improve stability of portions of landslides within 100 feet of existing off-site public improvements. Improvement may include subsurface drainage or construction of protective structures below the landslide and within a potential debris flow path to provide a reasonable level of additional protection for existing public improvements (i.e. Paradise Drive).

In general, the project’s geotechnical consultant (Miller Pacific) proposes three main methods of mitigation for the site landslides: use of subdrains, pier and grade beams, and debris fences. **Section 5.4 Geology and Soils** includes a discussion of each of the 28 previously mapped landslides and the proposed methods of mitigation.

**GRADING**

Applicant proposed grading is intended to prepare the project site for residential development by installing roadways and utilities and repairing landslides and unstable areas. The PDP includes a Grading Plan for the roadways and utility installation. The applicant also has prepared approximate grading quantities for the proposed landslide stabilization. A conceptual grading plan has been prepared for each of the 43 proposed lots. The grading plans are based on the building footprints shown on the Master Plan site plan.

**Exhibit 3.0-10** provides a summary of the volume of excavation and fill operations for the proposed roadways and utility installation, landslide stabilization, and individual lot grading. **Exhibit 3.0-11** provides a summary of the lot grading quantities based on the conceptual grading plans for each of the 43 proposed lots.

The applicant estimates that the grading necessary for site development (roadways and utility installation) would result in 13,580 cubic yards of cut material and the need for 2,866 cubic yards of fill material. Thus grading for the roadways and utility installation would result in an excess of 10,714 cubic yards.

The applicant’s estimate of grading quantities needed for removal and recompaction of slide debris, to complete conceptual landslide stabilization, would be approximately 58,030 cubic yards of material.

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36 *Grading Plan and Grading & Drainage Plan, Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C-1A and C-1B, op. cit.*

37 Letter to Martha Company c/o Mr. John Reed from Rusty Arend, Project Engineer, Miller Pacific Engineering Group, January 27, 2009, revised April 16, 2009, re: Response to Comments Marin County Community Development’s Agency’s Review.

The applicant estimates that the landslide stabilization would result in 1,444 cubic yards of cut and the need for 5,659 cubic yards of fill material. Thus landslide stabilization would result in the need for 4,215 cubic yards of fill material. It is estimated, therefore, that site development (roads, utility installation, and landslide stabilization) would generate 6,499 cubic yards of cut material. The applicant proposes to store these excess materials on the site in the vicinity of Lots 20 and 24. The material would be available for future development on individual lots. The applicant proposes that Lot 20 and/or 24 be the last developed with housing. This would permit either or both of these lots to be used as staging / storage areas for the materials for individual lot development.

The applicant estimates that the development of the 43 individual lots would result in 8,625 cubic yards of cut and the need for 11,488 cubic yards of fill material. This would result in the need for an additional 2,863 yards of fill material. Assuming that this total amount would be available from the material stored in the vicinity of Lots 20 and 24 development of the project site would result in an excess of 3,636 cubic yards material. This material would need to be transported off the site.

Section 5.4 Geology and Soils includes a discussion of the applicant’s anticipated grading for each residential lot and parcels A, B, and C.

Exhibit 3.0-10
Estimated Amounts of Grading Quantities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cubic Yards of:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cut</td>
<td>Fill</td>
<td>Import (Export)</td>
</tr>
<tr>
<td>Road Grading</td>
<td>11,010</td>
<td>4,156</td>
<td>(6,854)</td>
</tr>
<tr>
<td>Utility Installation</td>
<td>2,570</td>
<td>(1,290)</td>
<td>(3,860)</td>
</tr>
<tr>
<td>Subtotal - Grading &amp; Utilities</td>
<td>13,580</td>
<td>2,866</td>
<td>(10,714)</td>
</tr>
<tr>
<td>Landslide Stabilization - 10% R&amp;R</td>
<td>5,659</td>
<td>5,659</td>
<td></td>
</tr>
<tr>
<td>Landslide Stabilization - Other</td>
<td>1,444</td>
<td></td>
<td>(1,444)</td>
</tr>
<tr>
<td>Subtotal - Landslide Stabilization</td>
<td>1,444</td>
<td>5,170</td>
<td>4,215</td>
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<tr>
<td>Lot Development</td>
<td>8,625</td>
<td>11,488</td>
<td>2,863</td>
</tr>
<tr>
<td>Totals</td>
<td>23,649</td>
<td>20,013</td>
<td>(3,636)</td>
</tr>
</tbody>
</table>


39 7,000 cubic yards of fill material would result in a stock pile approximately ten feet high and 50 feet in diameter.

40 The estimates for lot grading are based exclusively on the conceptual grading plans. Because each home would be individually designed and engineered, the actual amount of cut and fill for lot development would change in accordance with the final home plans.
### Exhibit 3.0-11
#### Conceptual Lot Grading Quantities

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Cut Qty (Cubic Yds)</th>
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<th>Export (Cubic Yds)</th>
<th>Import (Cubic Yds)</th>
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<tr>
<td>4</td>
<td>6</td>
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<td>0</td>
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<td>186</td>
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<tr>
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<td>258</td>
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<tr>
<td>7</td>
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<td>603</td>
<td>0</td>
<td>272</td>
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<td>0</td>
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<tr>
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<td>289</td>
<td>0</td>
<td>182</td>
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<tr>
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<td>25</td>
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<td>57</td>
<td>318</td>
<td>0</td>
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<td>215</td>
<td>208</td>
<td>7</td>
<td>0</td>
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<td>161</td>
<td>0</td>
<td>34</td>
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<td>317</td>
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<td>43</td>
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<td>23</td>
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<td><strong>Totals</strong></td>
<td><strong>8,625</strong></td>
<td><strong>11,488</strong></td>
<td><strong>0</strong></td>
<td><strong>2,863</strong></td>
</tr>
</tbody>
</table>

Source: Lot Specific Conceptual Grading Plans, Land Development Solutions, Inc., January 2009
RETAINING WALLS

As a part of the on-site road construction it would be necessary to construct several retaining walls. Wall heights and lengths would vary as needed. Downhill walls over 2.5 feet in height may require guardrails or fencing. 41

Individual lot development would likely require construction of retaining walls. Such walls may be a continuation of the road walls. In order to facilitate this it is proposed to construct a soldier pile wall for each of the driveway cuts. 42 These walls would be removed once the driveway is connected to the road.

IMPLEMENTATION AND PHASING

The PDP includes a Construction Management Plan. 43 If approved by Marin County, the applicant would construct roadway extensions and install infrastructure. On-site project elements to be implemented by the applicant would involve grading and paving for roads, construction of retaining walls, clearing vegetation, trenching, installing all utilities (including conduits, pipelines, pump stations, and the 180,000-gallon water tank), re-planting grasslands and trees, and cleaning up the site.

Construction would occur in two sequential or overlapping phases.

- Phase One would include construction of Forest Glen Court and the realigned water line. The temporary construction access road, retaining walls, and paving would occur in this phase. The new MMWD water tank would also be constructed.

- Phase Two would include the clearing, grubbing, grading, landslide repair, subdivision road extensions, utility placement (including installation of pipelines, drop inlets, fire hydrants, electric and cable utility infrastructure) for lots adjacent to the Hill Haven neighborhood. Drainage and utility extensions would also be constructed in this phase.

During Phase One cut material from the lower site that would be necessary for lot development on the upper site would be stock piled in the vicinity of Lots 20 and 24. Excess material that would be unnecessary for future home construction would be hauled off site during this phase. This would permit subsequent home development on the site to have required fill available onsite, without additional import.

41 This refers to retaining walls that would be holding up the road with a drop-off from the road to the grade below. The Building Code requires that any wall over 30 inches must have a guard rail or other protective measure to prevent anyone from falling over the wall.

42 Soldier piles, also known as king piles or Berlin walls, are constructed of wide flange steel H sections spaced about two to three meters apart and are driven prior to excavation. As the excavation proceeds, horizontal timber sheeting (lagging) is inserted behind the H pile flanges. The horizontal earth pressures are concentrated on the soldier piles because of their relative rigidity compared to the lagging. Soil movement and subsidence is minimized by maintaining the lagging in firm contact with the soil.

43 Construction Management Plan, Easton Point – Project Narrative, applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009.
The PDP includes the development of a temporary construction access road from the terminus of Forest Glen Court to the terminus of Mt. Tiburon Court. The construction access road would be ten feet wide with turnouts and paved with grooved concrete. The construction access road would be the primary access to the site for construction vehicles, including earth moving, construction materials, and work crews.

Applicant-initiated construction activities are described below, and Exhibit 3.0-12 summarizes their approximate duration and the estimated number of construction workers on-site during each activity.

**Exhibit 3.0-12**
**Applicant-Implemented Construction**

<table>
<thead>
<tr>
<th>Task</th>
<th>Activity</th>
<th>Duration in Months</th>
<th>Construction Workers</th>
<th>Duration in Months</th>
<th>Construction Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Site Preparation</td>
<td>1</td>
<td>6-8</td>
<td>2</td>
<td>6-8</td>
</tr>
<tr>
<td>2</td>
<td>Grading</td>
<td>3</td>
<td>6-8</td>
<td>4</td>
<td>6-8</td>
</tr>
<tr>
<td>3</td>
<td>Utilities / Water Tank</td>
<td>6</td>
<td>6-8</td>
<td>4</td>
<td>6-8</td>
</tr>
<tr>
<td>4</td>
<td>Road Paving</td>
<td>1</td>
<td>6-8</td>
<td>1</td>
<td>6-8</td>
</tr>
<tr>
<td>5</td>
<td>Planting / Cleanup</td>
<td>1</td>
<td>6-8</td>
<td>1</td>
<td>6-8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>12</strong></td>
<td></td>
<td><strong>12</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: *Easton Point - Project Narrative*, Project Applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009.

- Task 1 Site Preparation would involve realignment of the existing MMWD water tank road and replacement of the 12 inch water main, to follow the Forest Glen Drive alignment. This task would include grading lots to provide staging area to place a construction trailer, parking for construction vehicle, and material storage, as follows:

Construction access road and Parcel C (water tank) – Construction staging would be located off the existing paved MMWD water tank access road in the general location of Lots 25 and 34.

All Upper Lots – Located along the existing fire road and along the new roadway leading to the proposed water tank site, with Lots 20 and 24 to be used for interim storage of cut necessary for individual lot development.

Lots 21 through 23 – Staging would occur within the individual lots’ boundaries or on-site at the end of Spanish Trail.

Lots 25 through 34 – Staging would occur within the individual lots’ boundaries or in the general locations of Lots 25 and 34.

- Task 2 Grading would include cut and fill operations for roads, retaining walls, landslide repairs, and utility trenching. Grading would involve operation of bulldozers, compactors, motor graders, scrapers, a water truck and transportation for workers. The contractor would define the limits of grading, install construction barriers around sensitive trees and vegetation to be avoided, and remove vegetation where construction is planned.
• Task 3 Utilities would involve installation of the new MMWD water tank, pumps, pipelines, conduits, and drainage improvements.

• Task 4 Road Paving would involve building retaining walls, installing curbs, gutters and storm water drainage drop inlets, and paving roadways.

• Task 5 would involve implementation of the proposed site enhancement measures (planting grasslands, tree replacement, etc.) and cleaning up the construction sites.

The Construction Management Plan includes specific measures to mitigate potential construction impacts to existing neighbors and to protect public safety. Included in the plan is the designation of a disturbance coordinator, traffic control measures, noise control measures, air quality control measures, and water quality control measures.

3.3 CUMULATIVE DEVELOPMENT ASSUMPTIONS

This EIR assesses the effects of implementing the proposed project under existing environmental conditions and under anticipated future “cumulative” conditions. Cumulative impacts are defined by CEQA to include impacts of little or no consequence when taken alone but, when combined with expected environmental conditions, would have a significant effect.

The *Tiburon General Plan* anticipates eventual buildout of the entire Tiburon Planning Area and estimates the amount of development that would result from full buildout consistent with allowable density and intensity limits of the Land Use Element. The *Tiburon General Plan* does not predict if or when buildout may occur.

For this EIR the geographic area considered for cumulative impacts is the Tiburon Planning Area plus the Strawberry Peninsula and the City of Belvedere. Cumulative development assumptions are shown in Exhibit 3.0-13.

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44 The Tiburon Planning Area consists of the incorporated Town of Tiburon, the unincorporated part of Paradise Drive, the unincorporated area between the western border of incorporated Tiburon and U.S. 101 north of Tiburon Boulevard, and all unincorporated portions of the Ring Mountain Open Space Preserve.
### Exhibit 3.0-13

**Cumulative Development Assumptions (Future Development to Occur)**

<table>
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<tr>
<th>Land Use</th>
<th>Total</th>
</tr>
</thead>
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<td><strong>Residential</strong></td>
<td></td>
</tr>
<tr>
<td>Single-family units</td>
<td>328 units</td>
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<td>Multi-family Units</td>
<td>95 units</td>
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<td>Second units</td>
<td>12 units</td>
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<tr>
<td><strong>Total Residential Units</strong></td>
<td><strong>435 units</strong></td>
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<tr>
<td><strong>Commercial</strong></td>
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<tr>
<td>Retail</td>
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<tr>
<td>Office</td>
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<td><strong>Total Commercial</strong></td>
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<tr>
<td>Synagogue Expansion</td>
<td>8,400 square feet</td>
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<tr>
<td>Day School Expansion</td>
<td>50 children</td>
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</table>

Sources: Fehr & Peers, Town of Tiburon and City of Belvedere

### 3.4 ADMINISTRATIVE ACTIONS

The proposed 2008 Easton Point Residential Development would require the following specific actions:

- Certification of the 2008 Easton Point Residential Development Environmental Impact Report by Marin County as accurate, complete, and objective.
- Rezoning approval
- Easton Point Master Plan approval.
- Precise Development Plan approval.
- Tentative Subdivision Map approval including Subdivision Standards Exception.
- Annexation of the project site to Sanitary District No. 5.
- Final Subdivision Map approval.
- Design Review for individual homes and certain subdivision improvements such as retaining walls.
3.0 Description of the Proposed Project

2008 Easton Point Residential Development Draft EIR

- Grading and building permits for all infrastructure improvements and landslide remediation.

- Building permits for construction on individual lots.

The Lead Agency for this EIR is Marin County. This report is intended to aid the public, agencies and organizations, and public decision-makers in their evaluation of the beneficial and adverse environmental effects of the proposed 2008 Easton Point Residential Development. Other agencies would have discretionary approvals related to the proposed project. A Responsible Agency includes “all public agencies other than the Lead Agency which have discretionary approval power over the project”. 45 A Trustee Agency is a “state agency having jurisdiction by law over resources affected by the project which are held in trust for the people of the State of California”. 46 Responsible and Trustee Agencies for the 2008 Easton Point Residential Development project include:

- **U.S. Army Corps of Engineers (Corps)** - Authorization would be required from the Corps under Section 404 of the Clean Water Act. Depending on the final extent of proposed fill to jurisdictional waters, the project may qualify for a Nationwide Authorization, but the USFWS would have to be consulted by the Corps as part of their interagency coordination. Compliance with the federal Endangered Species Act is one of numerous General Conditions for any Corps authorization under Section 404.

- **U.S. Fish and Wildlife Service (USFWS)** - USFWS would need to be consulted under Section 7 of the federal Endangered Species Act, and would need to make a finding regarding effect on federally listed species, including Marin dwarf flax and possibly California red-legged frog, both federally-listed as threatened.

- **San Francisco Bay Regional Water Quality Control Board (RWQCB)** - RWQCB would issue a certification or waiver for proposed modifications to jurisdictional waters under Section 401 of the Clean Water Act. They may have numerous requirements to replace or restore affected jurisdictional waters, under both Section 401 and the State Porter Cologne Act. A Stormwater Pollution Prevention Plan (SWPPP) would be required as a condition of the National Pollutant Elimination System (NPDES) permit, authorizations by the Corps and CDFG, and local grading plan approval.

- **California Department of Fish and Game (CDFG)** - CDFG would require a Streambed Alteration Agreement under Section 1600 of the Fish and Game Code for modifications to drainage channels and an Incidental Take Permit (Section 2081 Permit under the California Endangered Species Act) for impacts to the State-listed threatened Marin western flax.

- **Marin County Local Agency Formation Commission (LAFCo)** – Prior to recordation of the Final Subdivision Map LAFCo would need to approve annexation to Sanitary District No. 5.

- **Sanitary District Number 5 of Marin County** -- Sanitary District No. 5 would provide sanitary sewer service to the project site. The County will request that the District review and comment on the proposed Tentative Map. At that time the District could make specific recommendations including conditions that must be satisfied before approval of the Final Subdivision Map. The District must review the Improvement Plan for the subdivision and approve the final sewer plan

45 State CEQA Guidelines, Section 15381.

46 Ibid., Section 15386.
including compliance with Tentative Map conditions before the Final Subdivision Map can be approved. At that time, the District could make recommendations for changes or additions to the project.

- **Tiburon Fire Protection District (TFPD)** - The TFPD would assess the site plan and building design of each proposed lot and housing unit in conformance with the Uniform Fire Code (UFC), the TFPD’s Urban-Wildland Interface Code based on the standard criteria presented in the Hazard Matrix, and accessibility by emergency vehicle via on-site roadways and driveways based on the TFPD’s Emergency Access Standards and would evaluate adequacy of the design of the proposed water system to meet UFC requirements.

- **Marin Municipal Water District (MMWD)** - MMWD would provide water service to the site for both domestic and firefighting use. The County will request that the District review and comment on the proposed Tentative Map. At that time the District could make specific recommendations including conditions that must be satisfied before approval of the Final Subdivision Map. MMWD must review the Improvement Plan for the subdivision and approve the final water system plan including compliance with Tentative Map conditions and water conservation standards contained in MMWD Ordinances 385 and 326. At that time MMWD could make specific recommendations for changes or additions to the project.
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4.0 RELATIONSHIP TO PUBLIC PLANS
4.0 RELATIONSHIP TO PUBLIC PLANS

This chapter presents an analysis of the proposed project’s consistency with relevant public plans and policies.

The State CEQA Guidelines require EIRs to "... discuss any inconsistencies between the proposed project and applicable general plans and regional plans". 1 This chapter presents an analysis of the proposed 2008 Easton Point Residential Development project's consistency with adopted public plans and zoning in order to determine the extent to which the project would be consistent or would conflict with policies and zoning. One objective of this analysis is to provide information to find ways to modify the project to reduce any identified inconsistencies with relevant plans and policies. The project is examined in relation to policies and provisions of the following documents:

- Marin Countywide Plan (Marin County General Plan) – Adopted November 2007.
- Marin County Development Code (Zoning Ordinance)
- Marin County Single Family Residential Design Guidelines
- Marin County Community Development Agency Paradise Drive Visioning Plan
- Marin Local Agency Formation Commission (LAFCo) Policy Guidelines

The project site is located in unincorporated Marin County, within the Town of Tiburon’s Sphere of Influence. The proposed development application does not include annexation into the Town of Tiburon. Therefore, since the proposed development would remain within the jurisdiction of Marin County, this EIR analyzes the project’s conformance with the Marin Countywide Plan and Marin County Development Code (Zoning Ordinance). The project’s conformance with Town of Tiburon policies would only be relevant if the applicant was seeking land use and development entitlements from the Town.

General Plans articulate long-term goals and policies for economic growth, proposed use of land, development of infrastructure, conservation of resources, preservation of open space, and related issues (see Government Code sections 63300 and 65302). A project does not need to be consistent with every policy of a general plan; rather, it must be “generally consistent” and “in harmony”.

State law does not impose a requirement that a project completely satisfy every policy stated in a general plan. The goals, objectives, and policies in a general plan set the stage for later decision-making. As noted in the case of Sierra Club v. County of Napa, 2 "A project is consistent with a county's general plan if... “considering all its aspects; it will further the objectives and policies of the general plan and not obstruct their attainment. A given project need not be in perfect conformity with every general plan policy. To be consistent, a project must be compatible with the objectives, policies, general land uses and programs specified in the general plan" (internal citations omitted).

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1 State CEQA Guidelines, Section 15125(d).

A general plan “must try to accommodate a wide range of competing interests… and to present a clear and comprehensive set of principles to guide development decisions. Once a general plan is in place, it is the province of elected officials to examine the specifics of a proposed project to determine if it would be “in harmony” with the policies stated in the plan”. Recognizing that the plan provisions would ordinarily provide policy guidance on a range of issues, rather than mandatory, objective regulatory standards, the courts have recognized that the decision-maker must weigh plan policies when applying them, and that the law does not require every policy be completely satisfied. However, in some instances general plans contain fundamental, mandatory, and objective standards that do not allow any discretion in interpretation and application. A project will be found inconsistent with such a standard if it is clearly incompatible.

Consistency Determination

The consistency discussions in this chapter are based, in part, on applicant prepared information submitted to Marin County as a part of the project application. This material is described in Chapter 3.0 Description of the Proposed Project. The discussions provided below represent the EIR authors' best judgment of the policies examined. Marin County ultimately must determine the project's consistency with County policies before taking action to approve, conditionally approve, or deny the pending application. (Other responsible agencies similarly must determine the project's consistency with their relevant policies when reviewing and commenting on or taking action on the project.) The discussion in this EIR is intended to aid in these decisions.

While CEQA requires a discussion of consistency with public plans, inconsistency does not necessarily lead to a significant environmental impact. Inconsistencies with public plans create significant impacts under CEQA only when an adverse physical effect would result from the inconsistency. All adverse physical effects resulting from any inconsistency are discussed in the appropriate environmental analysis in the EIR (in Chapter 5.0 Environmental Setting, Impacts, and Mitigation Measures). The location of these environmental analyses is referenced in each policy discussion, as appropriate.


4 Ibid.

4.0 Relationship to Public Plans

2008 Easton Point Residential Development Draft EIR

4.1 MARIN COUNTYWIDE PLAN

The *Marin Countywide Plan* (CWP) sets forth policy guidelines for decision making on issues related to development and conservation in the unincorporated portions of Marin County. The CWP identifies goals, policies, and implementing programs in three broad areas:

- Natural Systems and Agricultural
- The Built Environment
- Socioeconomic issues

The CWP discusses each of these topics in a separate element.

**Countywide Plan Land Use Designations**

The CWP land use designations for the Easton Point site are Planned Residential (PR) (one dwelling unit per one to ten acres) and Single Family 6 (SR6) (four to seven dwelling units per acre). The portion of the project site northeast to where Spanish Trail Road intersects the site is designated SF6 and the remainder of the site is designated PR. It is estimated that approximately 4.5 acres of the site is within the SF6 designation. The remainder of the site (approximately 105.5 acres) is within the PR designation. The number of housing units permitted on the PR designated lands would range from 10 to 105. The number of housing units permitted on the SF6 designated lands would range from 18 to 31 units.

Approximately 70 acres of the land designated PR on the project site is also located in the County’s Ridge and Upland Greenbelt (RUG) area. The CWP directs that a variety of strategies be used to protect views of Ridge and Upland Greenbelt areas. It is also stated that the density for Ridge and Upland Greenbelt subdivisions should be calculated at the lowest end of the density range. The lowest end of the density range in the area designated PR is 1 unit/10 acres of land. The portion of the project site within the RUG totals an estimated 70 acres allowing for a total of 7 housing units. The remaining PR designated land on the project site is estimated at 35.5 acres with a density range of 1 unit/10 acres to 1 unit/acre resulting in a range of 3 to 35 housing units. Taking into consideration the density limitations of the Ridge and Upland Greenbelt; the range of housing units permitted within the area of the site designated PR would be reduced to 10 to 42 housing units.

The Easton Point Master Plan proposes 40 units in the PR designated area and 3 units in the area designated SF6. While the overall number of housing units proposed in the Master Plan is consistent with the density provisions of the RUG modified PR and SF6 land use designations; the distribution of

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the housing units on the subject property is not typical of the manner in which the Marin Community Development Agency (CDA) would implement the RUG. Normally, the Marin CDA would strive to limit the density of development within the area designated RUG to 7 housing units. However, given the provisions related to the enforcement of the 1976 Judgment, and the Court order directing that minimum one-half acre lots be placed on geologically stable portions of the project site, limitation of the density within the RUG would likely result in extensive landslide repair over non-RUG portions of the site in order to accommodate the Court-ordered density. In this case the most geologically safe portions of the project site are within the RUG. Therefore locating more than 7 housing units within the RUG is authorized by the 1976 Judgment.

Exhibit 4.0-2 assesses the consistency of the 2008 Easton Point Residential Development with the relevant goals and policies of the CWP.

**Visually Prominent Ridgelines**

The Tiburon Peninsula has numerous prominent ridgelines that provide scenic in-board and out-board views, and serve as natural boundaries to development by defining transition areas where development gives way to Marin’s natural open space. The Tiburon Ridge, which is the most prominent of these ridgelines, meanders from the boundary of the Ring Mountain Open Space Preserve towards the tip of the Tiburon Peninsula where it terminates at Mount Tiburon. The central spine of Tiburon Ridge is an important geographic feature that helps define and differentiate the community. Several of Tiburon’s other prominent ridges appear to extend from the Tiburon Ridge.

The project site has a steep topography with several ridges. The peaks of these ridges, or ridgelines, meander through the project site. At higher elevations these ridgelines continue onto adjacent properties, and at lower elevations these ridgelines terminate at Paradise Drive. **Exhibit 4.0-1** illustrates the location of ten ridgelines on the project site (Ridgelines A through J).

Policies in the CWP and Marin Development Code call for the protection of visually prominent ridgelines, however these planning documents do not provide specific criteria for determining which ridgelines are visually prominent. Marin Community Development Agency (CDA) staff, in consultation with contract staff, used the following criteria for determining if a ridgeline is “visually prominent”

- Is the geomorphic feature identified as a ridge?
- Does the identified ridge separate watersheds?
- Are the ridges or portions of the ridges located in the Ridge and Upland Greenbelt as delineated in the Marin Countywide Plan?

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9 *Marin Countywide Plan, op. cit., page 3-66.*

10 *Tiburon General Plan 2020 Draft EIR, Nichols • Berman, page 4.10-1, May 2005.*

11 Memo Regarding Visually Prominent Ridgelines, John Roberto, August 26, 2009.
• Is the ridge visible from public viewpoints (public open space, public trail heads, public parks, major public roadways, Bay waters).

• Does the ridge daylight when viewed from public viewpoints?

Based on the preceding prominence criteria Marin County CDA staff performed an analysis of ridgelines located on the project site and determined that six visually prominent ridgelines occur entirely or in part on the project site. The visually prominent ridgelines are Ridgelines A, C, D, and J plus those portions of Ridgelines E and F that are located within the Ridge and Upland Greenbelt area (see Exhibit 4.0-1). Therefore, CWP policies that require building setback areas from visually prominent ridgelines would apply to the project site for the case of the six visually prominent ridgelines identified on the project site by CDA staff, and the Tiburon Ridge, which is in close proximity to the project site.
Exhibit 4.0-1
Visually Prominent Ridgelines On-Site

Source: Nichols•Berman and Marin County Community Development Agency, 2009
**Exhibit 4.0-2**  
*Consistency with Marin Countywide Plan*

<table>
<thead>
<tr>
<th>Applicable Goal / Policy</th>
<th>Consistency Issue(s)</th>
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<tr>
<td>Natural Systems &amp; Agriculture Element - <strong>Biological Resources</strong></td>
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| **Goal BIO-1 Enhanced Native Habitat and Biodiversity.** Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County. | Potentially Inconsistent - The 2008 Easton Point Residential Development’s consistency with the stated objectives of Goal Bio-1 can be measured by considering the significance of environmental impacts on native habitat and biodiversity after implementation of proposed mitigation measures.  
As stated in **Section 5.6 Biological Resources**, seven different habitat types are located on the project site (see Exhibit 5.6-1). An estimated 44.08 acres of habitat that supports native species would potentially be lost upon implementation of the proposed project (see Exhibit 5.6-5). Consequently, implementation of the proposed project would result in eight significant impacts on biological resources. This includes impacts that would affect the populations of special status plant and animal species (see Impact 5.6-1 **Impacts to Special Status Plants** and Impact 5.6-2 **Impacts to California Red-Legged Frog**), and impacts to 9.72 acres of serpentine bunchgrass habitat which has the potential to support special status plant species and sustain botanical biodiversity on the project site (see Impact 5.6-3 **Loss of Serpentine Bunchgrass**). Proposed mitigation measures would reduce these impacts thereby maintaining viable native plant and animal populations that contribute to maintaining biodiversity within the County. However, mitigation measures 5.6-1(a) and 5.6-3(a) may require the strategic elimination and / or relocation of Lots 1 - 3. These mitigation measures may be infeasible because the elimination of lots conflicts with objectives of the proposed project, and relocation of these lots may have subsequent environmental impacts. Therefore, a failure to implement mitigation measures that would preserve viable populations of special status native plant species and help sustain biodiversity on the project site would result in a project that is inconsistent with Goal BIO-1. |
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<tr>
<th>Applicable Goal / Policy</th>
<th>Consistency Issue(s)</th>
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<tr>
<td><strong>Policy BIO-1.1  Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors.</strong></td>
<td>Potentially Inconsistent - Some elements of the proposed project demonstrate consistency with Policy BIO-1.1. The proposed project would not result in significant impacts to wildlife movement corridors, and there are no wildlife nursery areas located on the project site. The project includes a proposal to dedicate 59.6 acres of open space (Parcel A), which is consistent with the portion of Policy Bio-1.1 that calls for permanent protection of important natural habitats. Impacts to jurisdictional waters (Impact 5.6-5) would be reduced to a less-than-significant level by incorporation of proposed mitigation measures. However, as previously discussed in consistency issues with Goal BIO-1, the project site contains habitat for special status species that would be lost without implementation of all proposed mitigation measures 5.6-1(a) and 5.6-3(a). Should these mitigation measures be deemed infeasible, the proposed project would be inconsistent with those provisions of Policy BIO-1.1, which calls for protection of habitat for special-status species.</td>
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<td><strong>Policy BIO-1.2  Acquire Habitat.</strong> Continue to acquire areas containing sensitive resources for use as permanent open space, and encourage and support public and private partnerships formed to acquire and manage important natural habitat areas, such as baylands, wetlands, coastal shorelines, wildlife corridors, and other lands linking permanently protected open space lands.</td>
<td>Consistent - The proposed project includes dedication of 59.6 acres of public open space that contains habitat for Coast Live Oak Woodland, Northern Coyote Brush Scrub, Seasonal Wetlands, native grasslands, Marin Dwarf Flax, and Serpentine Reed Grass.</td>
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<td><strong>Policy BIO-1.3  Protect Woodlands, Forests, and Tree Resources.</strong> Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas. See also Policy SV-1.7.</td>
<td>Consistent - As discussed in <strong>Section 5.6 Biological Resources</strong>, The project would result in significant impacts from the loss of 7.4 to 12.32 acres of coast live oak woodland habitat and removal of an estimated 742 trees (see Impact 5.6-4 Loss of Coast Live Oak Woodland and Impact 5.6-8 Loss of Ordinance-Size Trees). However, implementation of Mitigation Measures 5.6-4 and 5.6-8 would reduce these impacts to less-than-significant levels. The proposed project includes dedication of a 59.60 acre parcel as public open space (Parcel A). Parcel A would include 35.6 acres of coast live oak woodland habitat that would be preserved in perpetuity. The permanent protection of these woodlands...</td>
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### Applicable Goal / Policy

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<tr>
<th>Policy BIO-1.4 Support Vegetation and Wildlife Disease Management Programs. Support agency programs and proven methods to limit the impacts of Sudden Oak Death syndrome and any other diseases harmful to native vegetation and wildlife in Marin County, while addressing any potential adverse effects on sensitive resources.</th>
<th>Consistent - As stated in Section 5.6 Biological Resources, it is the opinion of the EIR biologist that Sudden Oak Death (SODS) is likely present on the project site. The proposed project does not conflict with any vegetation and wildlife disease management programs. Mitigation Measure 5.6-4(b) requires disposal of cut down trees be consistent with the University of California Oak Mortality Task Force to reduce the likelihood of the spread of SODS. In addition, proposed mitigation measures support vegetation disease management by requiring fees paid in-lieu of on-site replacement plantings be ear-marked to fund maintenance of preserved woodlands on the project site, including SODS management (see Mitigation Measure 5.6-8).</th>
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<tr>
<td>Policy BIO-1.5 Promote Use of Native Plant Species. Encourage use of a variety of native or compatible non-native, non-invasive plant species indigenous to the site vicinity as part of project landscaping to improve wildlife habitat values.</td>
<td>Consistent - The proposed Architectural and Landscape Design Guidelines for Easton Point call for introduced landscaping to utilize primarily native plant species compatible with surrounding natural environment of the project site. The guidelines specify that introduced landscaping should include approximately 80 percent California native species tolerant to drought, fire, and frost.</td>
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<tr>
<td>Policy BIO-1.6 Control Spread of Invasive Exotic Plants. Prohibit use of invasive species in required landscaping as part of the discretionary review of proposed development. Work with landowners, landscapers, the Marin County Open Space District, nurseries, and the multi-agency Weed Management Area to remove and prevent the spread of highly invasive and noxious weeds. Invasive plants are those plants listed in the State’s Noxious Weed List, the California Invasive Plant Council’s list of “Exotic Pest Plants of Greatest Ecological Concern in</td>
<td>Consistent - The project would be consistent with policies to control the spread of invasive exotic plants through the implementation of feasible mitigation measures that require a Resource Management Plan (RMP) to help control invasive exotic species within Parcels A and B (Mitigation Measure 5.6-1(c)), and prohibition of invasive exotic species from use in project landscaping (Mitigation Measure 5.6-6). Furthermore, the proposed Architectural and Landscape Design Guidelines for Easton Point prohibit the use of invasive species,</td>
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12 Architectural and Landscape Design Guidelines for Easton Point, Easton Point – Project Narrative, project applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009, Appendix D.
### Applicable Goal / Policy

California,” and other priority species identified by the agricultural commissioner and California Department of Agriculture. Species of particular concern include the following:
- Barbed goatgrass (*Aegilops triuncialis*), giant reed (*Arundo donax*),
- Italian thistle (*Carduus pycnocephalus*), distaff thistle (*Carthamus lanatus*),
- Purple starthistle (*Centaurea calcitrapa*), yellow starthistle (*Centaurea solstitialis*),
- Pampas grass (*Cortaderia selloana*), Scotch broom (*Cytisus scoparius*),
- Cape ivy (*Delairea odorata*), oblong spurge (*Euphorbia oblongata*),
- Fennel (*Foeniculum vulgare*), French broom (*Genista monspessulana*),
- Salt-water cord grass (*Spartina alternifolia*),
- Spanish broom (*Spartium junceum*), medusahead (*Taeniatherum caput-medusae*),
- Gorse (*Ulex europaeus*), and periwinkle (*Vinca major*),

### Consistency Issue(s)

including plants listed in the State’s *Noxious Weed List*, The California Invasive Plant Council’s list of *Exotic Pest Plants of Greatest Ecological Concern in California*, and other priority invasive species as identified by the agricultural commissioner and California Department of Agriculture.  

#### Policy BIO-1.7 Remove Invasive Exotic Plants.

Require the removal of invasive exotic species, to the extent feasible, when considering applicable measures in discretionary permit approvals for development projects unrelated to agriculture, and include monitoring to prevent re-establishment unmanaged areas.

- **Consistent** - The proposed *Architectural and Landscape Design Guidelines for Easton Point* state existing invasive species must be removed by the landowner prior to installation of new landscaping.

#### Policy BIO-1.8 Restrict Use of Herbicides, Insecticides, and Similar Materials.

Encourage the use of integrated pest management and organic practices to manage pests with the least possible hazard to the environment. Restrict the use of insecticides, herbicides, or any toxic chemical substance in sensitive habitats, except when an emergency has been declared; the habitat itself is threatened; a substantial risk to public health and safety exists, including maintenance for flood control; or such use is authorized pursuant to a permit issued by the agricultural commissioner. Encourage nontoxic strategies for pest control, such as

- **Consistent** - The applicant’s Stormwater Control Plan states that landscaping would be designed to minimize the use of pesticides and herbicides.  

- Mitigation Measures for Impact 5.5-1 *Water Quality* contains measures that increase the projects consistency with this policy by requiring a Stormwater Control Plan with source control measures that include:

  - Providing residents with a list of specific chemical inputs tested and cleared by the USEPA for application to vegetation.

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### Applicable Goal / Policy

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| habitat management using physical and biological controls, as an alternative to chemical treatment, and allow use of toxic chemical substances only after other approaches have been tried and determined unsuccessful. Continue to implement the Integrated Pest Management ordinance for county-related operations. | • Indicate frequency and scheduling of the chemical inputs based on site-specific characteristics (such as soil and vegetative cover and rates of uptake) and the acknowledged sensitivity of downstream receiving waters.  
• Include homeowner education information to be incorporated in the project’s CC&Rs to instruct both the owners and their landscaping contractors in safe chemical handling and application procedures. (see Mitigation Measure 5.5-1(b)) |
| **Policy BIO-1.9 Control Spread of Non-Native Invasive Animal Species.** Work with landowners, the Marin County Open Space District, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the National Invasive Species Council, Point Reyes National Seashore, and other agencies and organizations to control and prevent the spread of non-native, invasive animal species. Species of particular concern include: introduced red fox (Vulpes vulpes), Chinese mitten crab (Eriocheir sinensis), bullfrog (Rana catesbeiana), and wild boar (Sus scrofa), among others. Wild turkey (Meleagris gallopavo) is also a non-native species of increasing abundance and concern in the county, and it requires careful management to prevent adverse impacts on native habitat. | **Consistent** - None of these species, or signs of these species, were observed on the site during surveys conducted by the EIR Biologist in 2009. Furthermore, there is no indication of these species being observed in past document surveys. Potentially, if California red-legged frog (CRLF) breeding habitat is created on-site through enhancement of existing wetlands, bullfrogs could invade these areas and prey on the CRLF. However, Mitigation Measure 5.6-1(c) requires development and implementation of a Resource Management Plan that includes CRLF predator management, such as for bullfrogs. |
| **Goal BIO-2 Protection of Sensitive Biological Resources.** Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts. | **Potentially Inconsistent** - The project site contains several sensitive biological resources which are discussed in **Section 5.6 Biological Resources**. These resources include special status plants (Marin dwarf flax and serpentine reed grass) discussed in Impact 5.6-1, the California Red Legged Frog (Impact 5.6-2), Serpentine Bunchgrass (Impact 5.6-3), Oak Woodland habitat (Impact 5.6-4), wetlands (Impact 5.6-5), active raptor nests (Impact 5.6-7), and native trees (Impact 5.6-8). Goal BIO-2 requires adequate protection and mitigation of sensitive... |
### Applicable Goal / Policy | Consistency Issue(s)
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#### Policy BIO-2.1 Include Resource Preservation in Environmental Review. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving “no net loss” of sensitive habitat acreage, values, and function.

- **Consistent** - The Draft EIR’s analysis of the proposed project’s impacts on biological resources complies with the requirements of CEQA and the direction contained in Policy BIO-2.1. **Section 5.6 Biological Resources** of the Draft EIR recommends mitigation measures that would adequately protect or compensate for the loss of biological resources to ensure their protection and “no net loss”, however some proposed mitigation measures (Mitigation Measures 5.6-1(a) and 5.6-3(a) - Relocation or elimination of proposed Lots 1, 2, and 3) may be found infeasible. Therefore compliance with Policy BIO-2.1 may not insure the protection of sensitive resources and achieving “no net loss” unless recommended mitigation measures are implemented.

#### Policy BIO-2.2 Limit Development Impacts. Restrict or modify proposed development in areas that contain essential habitat for special-status species, sensitive natural communities, wetlands, baylands and coastal habitat, and riparian habitats, as necessary to ensure the continued health and survival of these species and sensitive areas. Development projects should preferably be modified to avoid impacts on sensitive resources, or to adequately mitigate impacts by providing on-site or (as a lowest priority) off-site replacement at a higher ratio.

- **Potentially Inconsistent** - As stated in **Section 5.6 Biological Resources**, implementation of Mitigation Measures 5.6-1(a) and 5.6-3(a) may not be feasible. Absence of these mitigation measures would result in significant and unavoidable impacts to the Marin dwarf flax, serpentine reed grass, and Serpentine Bunchgrass habitat. Therefore the proposed project may be inconsistent with Policy BIO-2.2, which requires impacts be adequately mitigated.

#### Policy BIO-2.3 Preserve Ecotones. Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the

- **Consistent** - The most valuable ecotones that occur on the site are the transitions between woodland and grassland habitats, woodland and chaparral habitats, or wetlands/drainageways and surrounding habitats. While some of these ecotones may be impacted, such as within the...
### Applicable Goal / Policy

<table>
<thead>
<tr>
<th>Policy BIO-2.4  Protect Wildlife Nursery Areas and Movement Corridors. Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.</th>
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<tr>
<td>Consistency Issue(s)</td>
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<tr>
<td>private use area of Lot 13, the vast majority of such valuable ecotones would be preserved within Parcel A, and / or as a result of buffers that have been incorporated into the PDP around drainageways and wetlands.</td>
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<th>Policy BIO-2.5  Restrict Disturbance in Sensitive Habitat During Nesting Season. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional where development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.</th>
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<td>Consistent - Mitigation Measure 5.6-7 requires that pre-construction surveys for nesting birds be conducted within 250 feet of potential nesting habitats if construction activities will occur within the bird breeding season. It further requires that appropriate buffers be established around any active nests until it has been determined that all young birds have fledged and are foraging independently.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Policy BIO-2.6  Identify Opportunities for Safe Wildlife Movement. Ensure that existing stream channels and riparian corridors continue to provide for wildlife movement at roadway crossings, preferably through the use of bridges, or through over-sized culverts, while maintaining or restoring a natural channel bottom. Consider the need for wildlife movement in designing and expanding major roadways and other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent - The PDP does incorporate a minimum 100-foot setback between the edge of wetlands / drainageways on the project site. There are some encroachments into these setbacks that include the building site and landslide repairs on Lot 16, landslide repairs on Lots 17, 18 and 19, and landslide repairs on Parcel A. Mitigation measure 5.6-2(a) requires a corridor to preserve area for dispersal movements for the CRLF.</td>
</tr>
<tr>
<td>Applicable Goal / Policy</td>
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<tr>
<td>barriers in the county. Of particular concern is the possible widening of Highway 101 north of Novato to the county line, where maintenance of movement opportunities for terrestrial wildlife between the undeveloped habitat on Mount Burdell and the marshlands along the Petaluma River is critical.</td>
</tr>
<tr>
<td><strong>Policy BIO-2.7 Protect Sensitive Coastal Habitat.</strong> Protect coastal dunes, streams, and wetlands, and sensitive wildlife habitat from development in accordance with coastal resource management standards in the development code.</td>
</tr>
<tr>
<td><strong>Policy BIO-2.8 Coordinate with Trustee Agencies.</strong> Consult with trustee agencies (the California Department of Fish and Game, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Army Corps of Engineers, Environmental Protection Agency, Regional Water Quality Control Board, and Bay Conservation and Development Commission) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected.</td>
</tr>
<tr>
<td><strong>Policy BIO-2.9 Promote Early Consultation with Other Agencies.</strong> Require applicants to consult with all agencies with review authority for projects in areas supporting wetlands and special status species at the outset of project planning.</td>
</tr>
</tbody>
</table>
4.0 Relationship to Public Plans

2008 Easton Point Residential Development Draft EIR

Applicable Goal / Policy | Consistency Issue(s)
--- | ---
substantial efforts to identify and address wetland and special status species issues on the property. Comments from responsible agencies have been received for past projects that contain pertinent information to the current proposal, and have been taken into consideration by the EIR Biologist while developing proposed mitigation measures. Furthermore, as discussed above with Policy BIO 2.8, proposed mitigation measures include requirements to coordinate with responsible agencies for the implementation of mitigation measures.

**Goal BIO-3 Wetland Conservation.** Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.

**Consistent** - Measures included in Mitigation Measure 5.6-5 would reduce impacts to existing wetlands to mitigate for any loss of wetland.

**Policy BIO-3.1 Protect Wetlands.** Require development to avoid wetland areas so that the existing wetlands and upland buffers are preserved and opportunities for enhancement are retained (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone). Establish a Wetland Conservation Area (WCA) for jurisdictional wetlands to be retained, which includes the protected wetland and associated buffer area. Development shall be set back a minimum distance to protect the wetland and provide an upland buffer. Larger setback standards may apply to wetlands supporting special status species or associated with riparian systems and baylands under tidal influence, given the importance of protecting the larger ecosystems for these habitat types as called for under Stream Conservation and Baylands Conservation policies defined in Policy BIO-4.1 and BIO-5.1, respectively. Regardless of parcel size, a site assessment is required either where incursion into a WCA is proposed or where full compliance with all WCA criteria would not be met. 15

**Consistent** - As discussed in Section 5.6 Biological Resources 0.94 acres of seasonal wetland habitat are located within the project site. The project proposes to preserve 0.87 acres of wetland habitat within Parcel A. The remaining 0.07 acres of wetland would be located within the boundary of Lot 16, approximately 50 feet outside that lot’s building site. This policy requires a 100 foot setback from all wetlands. Therefore the building site of Lot 16 would encroach into the mandatory 100-foot setback. Additionally, proposed landslide repairs would result in some minor encroachments within the setback. However, Mitigation Measure 5.6-5(b) would reduce encroachment impacts to a less-than-significant level. As discussed with Impact 5.6-5, seasonal wetlands located on the project site would sustain significant impacts from secondary impacts resulting from the installation of landslide remediation. Proposed mitigation measures would reduce these impacts to a less-than-significant level and mitigate for any loss of wetlands.

15 Wetland protection criteria for evaluating development projects is contained in pages 2-22 thru 2-24 of the Marin Countywide Plan Natural Systems & Agricultural Element.
### Applicable Goal / Policy

<table>
<thead>
<tr>
<th>In the City-Centered Corridor:</th>
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<tbody>
<tr>
<td>• For parcels more than 2 acres in size, a minimum 100-foot development setback from wetlands is required.</td>
</tr>
<tr>
<td>• For parcels between 2 and 0.5 acres in size, a minimum 50-foot development setback from wetlands is required.</td>
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</tbody>
</table>

### Consistency Issue(s)

**Policy BIO-3.2 Require Thorough Mitigation.** Where avoidance of wetlands is not possible, require provision of replacement habitat on-site through restoration and/or habitat creation at a minimum ration of 2 acres for each acre lost (2:1 replacement ratio) for on-site mitigation and a minimum 3:1 replacement ratio for off-site mitigation. Mitigation wetlands should be of the same type as those lost and provide habitat for the species that use the existing wetland. Mitigation should also be required for incursion within the minimum WCA setback/transition zone.

**Consistent -** Mitigation Measure 5.6-5 requires thorough mitigation of impacts to wetlands by requiring a formal wetland delineation compensation for impacts to wetland and other jurisdictional waters by requiring a Wetland Mitigation and Monitoring Plan that would be included in the Resource Management Program that is first required by Mitigation Measure 5.6-1(c). The Wetland Mitigation and Monitoring Plan would include the following:

- Replacement of lost wetland habitat acreage at a ratio sufficient to retain functions and values. A 2:1 replacement:loss ratio would be expected to off-set wetland resource impacts adequately. Sufficient opportunities appear to be available on-site to carry out this replacement and may be combined with mitigations for a loss of CRLF habitat on-site (see Mitigation Measure 5.6-2).

- The development of quantifiable performance measures and final success criteria and remedial measures to be implemented should wetlands fail to meet performance measures and success criteria.

- Once-annual monitoring for a minimum five-year period (longer should wetlands not meet the final success criteria after five years), until wetlands meet the final success criteria.

- Establishment of undeveloped buffers on both sides of seasonal wetlands or seasonal drainage channels. A minimum buffer of
<table>
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<tr>
<th>Applicable Goal / Policy</th>
<th>Consistency Issue(s)</th>
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<tbody>
<tr>
<td><strong>Goal BIO-4 Riparian Conservation.</strong> Protect and, where possible, restore the natural structure and function of riparian systems.</td>
<td><strong>Consistent</strong> - The project site contains ephemeral drainages that would be impacted by the proposed development. These drainages are included in the discussion of potential jurisdictional waters located on the project site in Section 5.6 Biological Resources, and described above. Additionally there are riparian systems located off site that could be potentially affected by the proposed project. Potential impacts include increases and concentration of stormwater runoff, impacts to water quality, the threat of unrepaired landslide deposits entering the riparian systems, and non-native invasive plant species disturbing the natural ecological function of the riparian habitat. These potential impacts are discussed in Sections 5.4 Geology and Soils, 5.5 Hydrology and Water Quality, and 5.6 Biological Resources. Also discussed in these sections are the proposed mitigation measures that would reduce potential impacts to less-than-significant levels.</td>
</tr>
<tr>
<td><strong>Policy BIO-4.1 Restrict Land Use in Stream Conservation Areas.</strong> A Stream Conservation Area (SCA) is established to protect the active channel, water quality and flood control functions, and associated fish and wildlife habitat values along streams. Development shall be set back to protect the stream and provide an upland buffer, which is important to protect significant resources that may be present and provides a transitional protection zone. Best management practices(^{16}) shall be adhered to in all designated SCAs. Best management practices are also strongly encouraged in ephemeral streams not defined as SCAs.</td>
<td><strong>Consistent</strong> - Policy BIO-4.1 contains a minimum 100-foot development setback from the top of bank. As proposed, all lot development would occur outside of this setback, however, some permanent and temporary impacts would occur within this setback as a result of proposed landslide repairs. Mitigation Measure 5.6-5(b) would reduce any such permanent or temporary encroachment impacts to a less-than-significant level by requiring the inclusion in the RMP of a Wetland and Riparian Mitigation and Monitoring Plan for any such encroachments within the 100-foot set-back area. Although the project would adhere to setback requirements it would still have significant impacts upon the riparian systems located on or nearby the project site. As mentioned above with Goal BIO-4, proposed mitigation measures would impose adequate restrictions on the proposed project that would reduce these impacts to less-than-significant levels.</td>
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\(^{16}\) Best Management Practices are outlined in Start at the Source and Start at the Source Tools Handbook (Bay Area Stormwater Managers Agencies Association).
<table>
<thead>
<tr>
<th>Applicable Goal / Policy</th>
<th>Consistency Issue(s)</th>
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<tbody>
<tr>
<td><strong>Policy BIO-4.2  Comply with SCA Regulations.</strong> Implement established setback criteria</td>
<td>Consistent - The proposed project complies with the setback requirements contained</td>
</tr>
<tr>
<td>for protection of SCAs through established discretionary permit review processes and/or</td>
<td>in Policy BIO-4.1. Impacts to the hydraulic capacity, habitat values, function, and</td>
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<td>through adoption of new ordinances. Environmental review shall be required where</td>
<td>water quality of the ephemeral streams located on the project site, and nearby off</td>
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<td>incursion into an SCA is proposed and a discretionary permit is required. In</td>
<td>site riparian systems would be reduced to less-than-significant levels by proposed</td>
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<td>determining whether allowable uses are compatible with SCA regulations, development</td>
<td>mitigation measures.</td>
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<td>applications shall not be permitted if the project does any of the following:</td>
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<td>• Adversely alters hydraulic capacity</td>
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<td>• Causes a net loss in habitat acreage, value, or function</td>
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<tr>
<td>• Degrades water quality</td>
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<tr>
<td><strong>Policy BIO-4.3  Manage SCAs Effectively.</strong> Review proposed land division in SCAs</td>
<td>Consistent - The majority of ephemeral drainages located on the project site are</td>
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<td>to allow management of a stream by one property owner to the extent possible.</td>
<td>located within the 59.60 acre Parcel A, which is proposed to be dedicated as public</td>
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<td>open space and managed by Marin County.</td>
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<tr>
<td><strong>Policy BIO-4.4  Promote Natural Stream Channel Function.</strong> Retain and, where</td>
<td>Consistent - The proposed project would increase impervious surface on the project</td>
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<tr>
<td>possible, restore the hydraulic capacity and natural functions of stream channels in</td>
<td>site. Proposed detention facilities and additional mitigation measures would reduce</td>
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<td>SCAs. Discourage alteration of the bed or banks of the streams, including filling,</td>
<td>the amount and turbidity of storm water that enters the ephemeral drainages located</td>
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<td>grading, excavating, and installation of storm drains and culverts. When feasible,</td>
<td>on the project site, to a level that matches pre project levels.</td>
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<td>replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat,</td>
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<td>including through retention of large woody debris, except in cases where removal is</td>
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<td>essential to protect against property damage or prevent safety hazards. In no case</td>
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<td>shall alterations that create barriers to fish migration be allowed on streams mapped</td>
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<td>as historically supporting salmonids. Alteration of natural channels within SCAs for</td>
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<td>flood control should be designed and constructed in a manner that retains and protects</td>
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<td>the riparian vegetation, allows for sufficient capacity and natural channel migration,</td>
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<td>and allows for reestablishment of woody trees and shrubs without compromising the</td>
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<td>flood flow capacity where avoidance of existing riparian vegetation is not possible.</td>
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<td>Applicable Goal / Policy</td>
<td>Consistency Issue(s)</td>
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<tr>
<td><strong>Policy BIO-4.6 Control Exotic Vegetation.</strong> Remove and replace invasive exotic plants with native plants as part of stream restoration projects and as a condition of site-specific development approval in an SCA, and include monitoring to prevent reestablishment.</td>
<td><strong>Consistent</strong> - As discussed in Section 5.6 Biological Resources, the applicant proposes to implement measures to reduce the potential escape of invasive exotic landscape plants from lots’ landscaped with private use areas by listing in the CC&amp;Rs a list of native species to be planted within the private use areas as well as lists of exotic invasive plants that will be prohibited. Although there are no stream restoration projects proposed on the project site, measures to control the use of invasive plant species would help prevent the dispersal of exotic plant species along ephemeral stream channels located within the project site.</td>
</tr>
<tr>
<td><strong>Policy BIO-4.7 Protect Riparian Vegetation.</strong> Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.</td>
<td><strong>Consistent</strong> - As discussed in Section 5.6 Biological Resources, the project site contains a total of 0.94 acres of freshwater wetland and aquatic habitat containing riparian vegetation. Impacts to riparian vegetation would be reduced to less-than-significant levels with the implementation of Mitigation Measure 5.6-5.</td>
</tr>
<tr>
<td><strong>Policy BIO-4.8 Reclaim Damaged Portions of SCAs.</strong> Restore damaged portions of SCAs to their natural state wherever possible, and reestablish as quickly as possible any herbaceous and woody vegetation that must be removed within an SCA, replicating the structure and species composition of indigenous native riparian vegetation.</td>
<td><strong>Consistent</strong> - Mitigation Measure 5.6-5(b) requires a Wetland and Riparian Mitigation and Monitoring Plan to mitigate permanent and temporary impacts to drainage habitats on-site.</td>
</tr>
<tr>
<td><strong>Policy BIO-4.13 Provide Appropriate Access in SCAs.</strong> Ensure that public access to publicly owned land within SCAs respects the environment, and prohibit access if it will degrade or destroy riparian habitat. Acquire public lands adjacent to streams where possible to make resources more accessible and usable for passive recreation, and to protect and enhance streamside habitat.</td>
<td><strong>Consistent</strong> - The ephemeral streams located on the project site function as seasonal drainage ways that run along the hillside, and are sometimes located in areas with steep topography. Where the streams are level, and water collects, sensitive habitat can be found that would be susceptible to damage from public access. There are no trails proposed in the areas where ephemeral streams can be found.</td>
</tr>
<tr>
<td><strong>Policy BIO-4.14 Reduce Road Impacts in SCAs.</strong> Locate new roads and roadfill slopes outside SCAs, except at stream crossings, and consolidate new road crossings wherever possible to minimize disturbance in the SCA. Require spoil from road construction to be deposited outside the SCA, and take special care to stabilize soil surfaces.</td>
<td><strong>Consistent</strong> - The proposed project does not include construction of any roads within the areas where ephemeral streams are located.</td>
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<tr>
<td>Applicable Goal / Policy</td>
<td>Consistency Issue(s)</td>
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<td><strong>Policy BIO-4.15 Reduce Wet Weather Impacts.</strong> Ensure that development work adjacent</td>
<td><em>Consistent</em> - The proposed project includes a stormwater control plan with measures that would reduce wet weather impacts. 17 Furthermore proposed mitigation measures require revegetation (Mitigation Measure 5.5-1(a)) to mitigate erosion and other wet weather impacts.</td>
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<td>to and potentially affecting SCAs is not done during the wet weather or when water is</td>
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<td>flowing through streams, except for emergency repairs, and that disturbed soils are</td>
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<td>stabilized and replanted, and areas where woody vegetation has been removed are</td>
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<td>replanted with suitable species before the beginning of the rainy season.</td>
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<tr>
<td><strong>Policy BIO-4.16 Regulate Channel and Flow Alteration.</strong> Allow alteration of stream</td>
<td><em>Consistent</em> - This Draft EIR contains analysis of how ephemeral streams on the project site may be impacted by the proposed development and includes recommended mitigation measures to reduce the identified impacts.</td>
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<tr>
<td>channels or reduction in flow volumes only after completion of environmental review,</td>
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<td>commitment to appropriate mitigation measures, and issuance of appropriate permits by</td>
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<td>jurisdictional agencies based on determination of adequate flows necessary to protect</td>
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<tr>
<td>fish habitats, water quality, riparian vegetation, natural dynamics of stream functions,</td>
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<td>groundwater recharge areas, and downstream users.</td>
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<tr>
<td>**Policy BIO-4.18 Promote the Use of Permeable Surfaces When Hardscapes Are Unavoidable</td>
<td><em>Consistent</em> - With one exception (Lot 16) house construction would occur outside of the SCA’s and WCA’s that are located on the project site. Use of permeable surfaces for house construction on Lot 16 does not appear to be feasible. Landslide repairs occurring within the SCA and WCA are primarily either permeable or underground (i.e. remove and replace, buried drilled pier, subdrains, etc.). The only non-permeable landslide repairs within the SCA and WCA would include the beam wall on Lot 16.</td>
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<td>in the SCA and WCA. Permeable surfaces rather than impermeable surfaces shall be required</td>
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<td>wherever feasible in the SCA and WCA.</td>
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<tr>
<td><strong>Policy BIO-4.19 Maintain Channel Stability.</strong> Applicants for development projects may</td>
<td><em>Consistent</em> - The applicant has submitted a pre- and post-construction hydrologic analysis of the project site including runoff calculations and impacts on existing drainage systems. 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation discusses the project’s potential to increase erosion of downstream water courses that would receive concentrated stormwater discharges from subdrains and</td>
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### Applicable Goal / Policy

<table>
<thead>
<tr>
<th>Dickinson/Dam 1997  Road Infrastructure Development Draft EIR</th>
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</thead>
<tbody>
<tr>
<td><strong>Consistency Issue(s)</strong></td>
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<tr>
<td>banks (e.g., sloughing or landsliding), tree collapse due to streambank undermining and/or soil loss, or severe in-channel sedimentation, as determined by the County.</td>
</tr>
<tr>
<td>Policy BIO-4.20  Minimize Runoff. In order to decrease stormwater runoff, the feasibility of developing a peak stormwater management program shall be evaluated to provide mitigation opportunities such as removal of impervious surface or increased stormwater detention in the watershed.</td>
</tr>
<tr>
<td><strong>Natural Systems and Agriculture Element - Water Resources</strong></td>
</tr>
<tr>
<td><strong>Goal WR-1  Healthy Watersheds.</strong> Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.</td>
</tr>
<tr>
<td>Policy WR-1.1  Protect Watersheds and Aquifer Recharge. Give high priority to the protection of watersheds, aquifer-recharge areas, and natural drainage systems in any consideration of land use.</td>
</tr>
<tr>
<td>Policy WR-1.3  Improve Infiltration. Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site’s predevelopment infiltration to reduce downstream erosion and flooding.</td>
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<tr>
<td>Applicable Goal / Policy</td>
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<tr>
<td><strong>Policy WR-1.4 Protect Upland Vegetation.</strong> Limit development and grazing on steep slopes and ridgelines in order to protect downslope areas from erosion and to ensure that runoff is dispersed adequately to allow for effective infiltration.</td>
</tr>
<tr>
<td><strong>Policy WR-2.1 Reduce Toxic Runoff.</strong> Reduce the volume of urban runoff from pollutants -- such as pesticides from homes, golf courses, cleaning agents, swimming pool chemicals, and road oil -- and of excess sediments and nutrients from agricultural operations.</td>
</tr>
<tr>
<td><strong>Policy WR-2.3 Avoid Erosion and Sedimentation.</strong> Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.</td>
</tr>
<tr>
<td><strong>Goal WR-3 Adequate Water for Wildlife and Humans.</strong> Ensure that the available supply of surface and groundwater is used responsibly, so that the needs of both wildlife and human populations are met</td>
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<tr>
<td>Applicable Goal / Policy</td>
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<tr>
<td><strong>Policy WR-3.1 Conserve Water and Develop New Sustainable Sources.</strong> Reduce the waste of potable water through efficient technologies, conservation efforts, and design and management practices, and by better matching the source and quality of water to the user’s needs.</td>
</tr>
<tr>
<td><strong>Policy WR-3.2 Mitigate Water Demand in New Development.</strong> Assess and mitigate the impacts of new development on potable water supplies and water available for wildlife.</td>
</tr>
<tr>
<td><strong>Natural Systems and Agriculture Element - Environmental Hazards</strong></td>
</tr>
<tr>
<td><strong>Goal EH-1 Hazard Awareness.</strong> Raise public awareness and responses about potential environmental hazards.</td>
</tr>
<tr>
<td><strong>Policy EH-1.3 Identify Evacuation Routes.</strong> Provide the public with information identifying accessible evacuation routes for fire, geologic, and other hazards.</td>
</tr>
<tr>
<td><strong>Goal EH-2 Safety from Seismic and Geologic Hazards.</strong> Protect people and property from risks associated with seismic activity and geologic activity and geologic conditions.</td>
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<td>Applicable Goal / Policy</td>
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<tr>
<td><strong>Policy EH-2.1 Avoid Hazard Areas.</strong> Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.</td>
</tr>
<tr>
<td><strong>Policy EH-2.2 Comply with the Alquist-Priolo Act.</strong> Continue to implement and enforce the Alquist-Priolo Earthquake Fault Zoning Act.</td>
</tr>
<tr>
<td><strong>Policy EH-2.3 Ensure Seismic Safety of New Structures.</strong> Design and construct all new buildings to be earthquake resistant. The minimum level of design necessary would be in accordance with seismic provisions and criteria contained in the most recent version of the State and County Codes. Construction would require effective oversight and enforcement to ensure adherence to the earthquake design criteria.</td>
</tr>
<tr>
<td><strong>Goal EH-3 Safety from Flooding and Inundation.</strong> Protect people and property from risks associated with flooding and inundation.</td>
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### Applicable Goal / Policy

<table>
<thead>
<tr>
<th>Policy EH-3.2 Retain Natural Conditions</th>
<th>Consistency Issue(s)</th>
</tr>
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<tbody>
<tr>
<td>Ensure that flow capacity is maintained in stream channels and floodplains, and achieve flood control using biotechnical techniques instead of storm drains, culverts, riprap, and other forms of structural stabilization.</td>
<td>Inconsistent - The proposed project is a development project and therefore does not retain the natural conditions of the hydrology on the project site. The project proposes a storm drain system, and also includes subdrains that would dewater hillsides (landslide repair). Therefore the project would significantly alter the natural characteristics of existing stormwater flow on the project site. However, implementation of the hydrologic mitigation measures contained in the hydrology section of the EIR would ensure that there is no downstream flooding and increased peak hour flows would not exceed the existing capacity of culverts under Paradise Drive.</td>
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</tbody>
</table>

| Policy EH-3.3 Monitor Environmental Change | Consistent - As discussed in Section 7.2 Cumulative Impacts, cumulative impacts to hydrological conditions would result from the anticipated buildout of the Tiburon Planning Area with or without the proposed project. With utilization of proposed stormwater detention facilities and mitigation measures intended to prevent downstream erosion and sedimentation, the project would make a less than cumulatively considerable contribution to cumulative impacts related to flooding and inundation. |
| Monitor Environmental Change | Consistent - As discussed in Section 7.2 Cumulative Impacts, cumulative impacts to hydrological conditions would result from the anticipated buildout of the Tiburon Planning Area with or without the proposed project. With utilization of proposed stormwater detention facilities and mitigation measures intended to prevent downstream erosion and sedimentation, the project would make a less than cumulatively considerable contribution to cumulative impacts related to flooding and inundation. |

<table>
<thead>
<tr>
<th>Goal EH-4 Safety from Fires</th>
<th>Consistent - The project would comply with the requirements of the 2003 Urban Wildland Interface Code, the 2007 California Building Code Chapter 7A, and the Tiburon Fire Protection District. Mitigation</th>
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<tbody>
<tr>
<td>Protect people and property from hazards associated with wildland and structural fires.</td>
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</table>

eroded sediment in downstream stormwater drainage facilities (*Section 5.5 Hydrology and Water Quality*). As discussed with Impact 5.5-7 On-Site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection, the applicant proposes the use of stormwater detention facilities that would eliminate potential impacts on downstream stormdrain facilities from runoff volumes and protect against downstream flooding. Furthermore, measures to mitigate downstream sedimentation impacts discussed with Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation would effectively prevent the accumulation of eroded sediment in downstream stormdrain facilities.
### Applicable Goal / Policy

<table>
<thead>
<tr>
<th>Policy EH-4.1 Limit Risks to Structures. Ensure that adequate fire protection is provided in new development and when modifications are made to existing structures.</th>
<th>Consistency Issue(s)</th>
<th>Measure 5.1-9 requires proposed roadways to meet TFPD standards for emergency vehicle access and Mitigation Measure 5.7-1(b) would reduce significant emergency radio coverage impacts regarding the existing MERA system.</th>
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<tr>
<td>Policy EH-4.2 Remove Hazardous Vegetation. Abate the buildup of vegetation around existing structures or on vacant properties that could help fuel fires.</td>
<td>Consistent - The issue of vegetative fuels is discussed with Impact 5.7-2 Wildland-Building Fire Exposure. Development on the project site may expose houses and structures to wildland fire risks. The proposed project includes, along with conceptual landscape plans, vegetation management plans proposed for each parcel that include a home ignition zone, defensible space zones, and portions of wildland reduction zones spread throughout the project site including private property and common open space.</td>
<td></td>
</tr>
<tr>
<td>Policy EH-4.4 Ensure Adequate Emergency Response. Ensure that there is an adequate number of trained and certified emergency medical technicians to address the increase in medical demand.</td>
<td>Consistent - Section 5.7 Public Services discusses the service capacity of local emergency services. Both the Tiburon Fire Protection Service and the Marin County Sheriff’s Department would be able to serve the proposed project along with cumulative service demand increases within their jurisdictions.</td>
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### Applicable Goal / Policy

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<thead>
<tr>
<th>Natural Systems and Agriculture Element - Atmosphere and Climate</th>
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<tbody>
<tr>
<td><strong>Goal AIR-1 Improved Regional Air Quality.</strong> Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.</td>
</tr>
<tr>
<td>Consistent - The proposed project would not interfere with any planning efforts, or implementation of programs aimed at improving regional air quality, or transportation plans intended to reduce personal vehicle trips by offering alternative modes of transportation.</td>
</tr>
<tr>
<td><strong>Policy AIR-1.1 Coordinate Planning and Evaluation Efforts.</strong> Coordinate air quality planning efforts with local, regional, and State agencies, and evaluate the air quality impacts of proposed plans and development projects.</td>
</tr>
<tr>
<td>Consistent - The proposed project has been evaluated for its potential impacts to air quality. <strong>Section 5.2 Air Quality</strong> discusses Construction-Period Air Pollutant Emissions (Impact 5.2-1), generation of airborne asbestos (Impact 5.2-2), and greenhouse gas emissions (Impact 5.2-3). As discussed in these impacts analyses, the project would not result in any significant impacts to air quality.</td>
</tr>
<tr>
<td><strong>Policy AIR-1.2 Meet Air Quality Standards.</strong> Seek to attain or exceed the more stringent of federal or State Ambient Air Quality Standards for each measured pollutant.</td>
</tr>
<tr>
<td>Consistent - As discussed in <strong>Section 5.2 Air Quality</strong>, the Tiburon Peninsula features good air quality and Marin County is not a part of any regional nonattainment of air pollutants. The proposed project would generate air pollutant emissions well below the thresholds of the BAAQMD, and would not lead to nonattainment of any measured pollutant.</td>
</tr>
<tr>
<td><strong>Policy AIR-1.3 Require Mitigation of Air Quality Impacts.</strong> Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.</td>
</tr>
<tr>
<td>Consistent - <strong>Section 5.2 Air Quality</strong> identifies potential impacts resulting from construction period air pollutant emissions and proposes mitigation (Mitigation Measure 5.2-1). Other impacts discussed are related to the generation of airborne asbestos and greenhouse gas emissions do not require any mitigation.</td>
</tr>
<tr>
<td><strong>Policy AIR-3.1 Institute Transportation Control Measures.</strong> Support a transportation program that reduces vehicle trips, increases ridesharing, and meets or exceeds the Transportation Control Measures recommended by BAAQMD in the most recent Clean Air Plan to reduce pollutants generated by vehicle use.</td>
</tr>
<tr>
<td>Consistent - The proposed project would not interfere with implementation of any transportation plans intended to reduce the number of vehicle trips in the area. Furthermore the proposed project would only make an incremental increase to personal/private vehicle trips in the area.</td>
</tr>
<tr>
<td><strong>Goal AIR-4 Minimization of Contributions to Greenhouse Gases.</strong> Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning.</td>
</tr>
<tr>
<td>Consistent - The proposed project would not interfere with implementation of planning efforts to reduce greenhouse gas emissions. <strong>Section 5.2 Air Quality</strong> discusses regional efforts to curb greenhouse gas emissions. Carbon Dioxide generation for energy creation and...</td>
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<tr>
<td>Applicable Goal / Policy</td>
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<td>process.</td>
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<tr>
<td><strong>Policy AIR-4.1 Reduce Greenhouse Gas Emissions.</strong> Adopt practices that promote improved efficiency and energy management technologies; shift to low-carbon and renewable fuels and zero emissions technologies.</td>
</tr>
<tr>
<td><strong>Policy AIR-4.2 Foster the Absorption of Greenhouse Gases.</strong> Foster and restore forests and other terrestrial ecosystems that offer significant carbon mitigation potential.</td>
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<tr>
<td><strong>Natural Systems and Agriculture Element - Open Space</strong></td>
</tr>
<tr>
<td><strong>Goal OS-1 Sustainable Managed Open Space.</strong> Manage open space in a sustainable manner for environmental health and the long-term protection of resources.</td>
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### Applicable Goal / Policy

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<tr>
<th>Goal OS-2  Preservation of Open Space for the Benefit of the Environment and Marin Residents. Close the gaps in the pattern of protected public open space and private lands where land acquisition or other methods of preservation would create or enhance community separators, wildlife corridors, watershed and baylands protection, riparian corridors, sensitive habitat, or trail connections.</th>
<th>Inconsistent - The proposed project includes an offer to dedicate a 59.6 acre parcel of land located within the development as public open space. Parcel A is contiguous to existing public open space thereby maintaining and expanding the existing pattern of open space. However, Parcel B is not contiguous and would be separated from existing open space by private residential lots.</th>
</tr>
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<tr>
<td>Policy OS-2.2 Continue to acquire or otherwise preserve additional open space countywide. Targeted greenbelts and community separators in the Baylands and City-Centered corridors include the following: Tiburon Peninsula Ridge includes trails to several points along the bay. The Open Space District and the Town of Tiburon have acquired portions of this ridge</td>
<td>Consistent - As stated above, the project includes an offer to dedicate a 59.6 acre open space parcel to the public.</td>
</tr>
<tr>
<td>Policy OS-2.4 Support Open Space Efforts Along Streams. Support efforts to restore, enhance, and maintain natural vegetation and other habitat values along streams in the Baylands and City-Centered corridors. Maintain strict controls and high environmental standards in these zones.</td>
<td>Consistent - As proposed, Parcel A contains a variety of habitats and portions of ephemeral streams. However, public access would be limited to reduce the risks of pedestrian impacts on sensitive habitats.</td>
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### Natural Systems and Agriculture Element – Trails

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<tr>
<th>Goal TRL-1 Trail Network Preservation and Expansion. Preserve existing trail routes designated for public use on the Marin Countywide Trails Plan maps, and expand the public trail network for all user groups, where appropriate. Facilitate connections that can be used for safe routes to school and work.</th>
<th>Inconsistent - As proposed the project does not include trails consistent with the Marin Countywide Trails Plan. See discussion of consistency with Polices TRL-1.2 and TRL-1.4 below for a further explanation.</th>
</tr>
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<tr>
<td>Policy TRL-1.2 Expand the Countywide Trail System. Acquire additional trails to complete the proposed countywide trail system, providing access to or between public lands and enhancing public trail use opportunities for all user groups, including multi-use trails, as appropriate.</td>
<td>Inconsistent - The Marin Countywide Trails Plan Map depicts a proposed “Bay, Coastal or Ridge Trail” along Paradise Drive at the project site boundary. The map also shows proposed trails within the project site that would provide access to Old St. Hillary’s open space, located adjacently west of the project site. As proposed the 2008 Easton Point Residential Development does not include trails consistent with the Marin Countywide Trails Plan, and therefore is inconsistent with policies to expand the Countywide System.</td>
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4.0 Relationship to Public Plans

2008 Easton Point Residential Development Draft EIR

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<th>Consistency Issue(s)</th>
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<tr>
<td><strong>Policy TRL-1.4 Coordinate Trail Planning.</strong> Promote collaboration among public land management agencies, nongovernmental organizations, and private landowners to implement the Marin Countywide Trails Plan and regional trail systems.</td>
<td>Inconsistent - As previously stated in the discussion regarding the project’s inconsistency with Policy TRL-1.2, the project does not include proposed trails that are called for in the Marin Countywide Trails Plan.</td>
</tr>
<tr>
<td><strong>Policy TRL-2.2 Respect the Rights of Private Landowners.</strong> Design and manage trails to avoid trespass and trail construction impacts on adjacent private land.</td>
<td>Consistent - No formal trails are proposed as part of the development. The pedestrian pathway and public access easement proposed along the extension of Ridge Road and Mt. Tiburon Road would reduce the risk of trespass on private property in the area.</td>
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</table>

**Built Environment Element – Community Development**

<p>| Policy CD-1.1 Direct Land Uses to Appropriate Areas. Concentrate urban development in the City-Centered Corridor, where infrastructure and facilities can be made available most efficiently. Protect sensitive lands in the Baylands Corridor. Emphasize agricultural uses in the Inland Rural Corridor, along with preservation of resources, habitat, and existing communities. Focus on open space, recreational, and agricultural land uses, as well as preservation of existing communities, in the Coastal Corridor. | Consistent - The project site is located within the City-Centered Corridor, as shown on Map 3-1b “Environmental Features Focusing Development Within The City-Centered Corridor”, in the Marin Countywide Plan. The project site is located adjacent north of the Hill Haven subdivision and would connect to existing utility infrastructure. Access to the project site would be provided via existing roadways of Paradise Drive and Ridge Road, which would provide connectivity to the Hill Haven subdivision. Located in an area where nearby public services, such as schools, shopping, and library, the project site is a logical location and provides transition in housing densities from the higher density single family homes in the Hill Haven subdivision into the upland greenbelt area that borders the project site. |
| <strong>Policy CD-1.2 Direct Urban Services.</strong> Discourage extension of urban levels of service to serve new development beyond urban service areas. | Consistent - The project location would require minimal extension of urban services. If approved the site would be accessed from the existing roadways of Paradise Drive and Ridge Road. Some utilities already exist at the project site in the form of an existing water storage tank (Paradise Tank) and an eight inch water main located within the Paradise Drive right of way. Existing sewage infrastructure is located nearby and would require the project applicant to install approximately 800 feet of new sewage pipe to facilitate a connection. Gas and electrical can be extended from nearby existing facilities. As designed the project would provide a logical transition in housing density from... |</p>
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<td>the higher densities of the Hill Haven subdivision (3 housing units per acre) and the Mar East neighborhood (4.4 housing units per acre). The proposed roadway circulation takes advantage of existing streets (Paradise Drive and Ridge Road) and does not include roadway that could be further extended to promote additional development in the area and result in growth inducing impacts.</td>
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<tr>
<td><strong>Policy CD-1.3 Reduce Potential Impacts.</strong> Calculate potential residential densities and commercial floor area ratio (FAR) at the low end of the applicable range on sites with sensitive habitat or within the Ridge and Upland Greenbelt, or properties lacking public water or sewer systems except for multi-family parcels identified in certified Housing Elements.</td>
<td>Consistent - The Marin Countywide Plan has two land use designations that overlap the project site. Approximately 4.5 acres fall within the SF6 land use designation, which allows 4-7 housing units per acre. Approximately 104.8 acres are within the Planned Residential (PR) land use designation. Approximately 70 acres of the PR designation is within the Ridge and Upland Greenbelt. Using the low end of the permitted densities for the PR designation would permit ten units. The SF6 designation, which is not sensitive habitat, would permit up to 31 units. So, based on this policy the permitted number of units would be 41.</td>
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<tr>
<td><strong>Policy CD-2.1 Provide a Mix of Housing.</strong> The range of housing types, sizes, and prices should accommodate workers employed in Marin County. This includes rental units affordable to lower-wage earners and housing that meets the needs of families, seniors, disabled persons, and homeless individuals and families.</td>
<td>Inconsistent - As proposed the project would increase the local supply of expensive housing. All requested house sizes are large and future home prices are expected to be beyond the affordable price range for workers employed in Marin County. There is no range of housing types proposed.</td>
</tr>
<tr>
<td><strong>Policy CD-2.5 Locate Housing Near Activity Centers.</strong> Provide housing near jobs, transit routes, schools, shopping areas, and recreation to discourage long commutes and lessen traffic congestions.</td>
<td>Consistent - The project site is located approximately one half mile from downtown Tiburon (as the crow flies), which provides access to shopping, Town Hall, and waterfront recreation.</td>
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<tr>
<td><strong>Policy CD-2.8 Limit Development in Resource or Hazard Areas.</strong> Discourage development in areas with high natural resource value or threats to life or property, and restrict development in such areas to minimize adverse impacts.</td>
<td>Inconsistent - Development of the project as proposed would result in significant unavoidable impacts to valuable natural resources. Implementation of mitigation measures would reduce some impacts on natural resources. However, the subject property has significant geologic constraints (landslides) that would continue to pose a risk to property. Implementation of the project’s geotechnical engineer’s recommendations and the mitigation measures contained in the geology section of the EIR would minimize the adverse impacts of landslides on...</td>
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### Applicable Goal / Policy

**Goal CD-5 Effective Growth Management.** Manage growth so that transportation, water, sewer, wastewater facilities, fire protection, and other infrastructure components remain adequate.

**Policy CD-5.1 Assign Financial Responsibility for Growth.** Require new development to pay its fair share of the cost of public facilities, services, and infrastructure, including but not limited to transportation, incremental water supply, sewer and wastewater treatment, solid waste, flood control and drainage, schools, fire and police protection, and parks and recreation. Allow for individual affordable housing projects to be exempted from the full cost of impact fees, subject to meeting specified criteria.

**Policy CD-5.2 Correlate Development and Infrastructure.** For health, safety, and general welfare, new development should occur only when adequate infrastructure is available, consistent with the following findings:

- a. Project-related traffic will not cause the level of service established in the circulation element to be exceeded.
- b. Any circulation improvements or programs needed to maintain the established level of service standard have been programmed and funding has been committed.
- c. Environmental review of needed circulation improvements or programs will not cause the established level of service standard to be exceeded.
- d. The time frame for completion of the needed circulation improvements or programs will not cause the established level of service standard to be exceeded.
- e. Wastewater, water (including for adequate fire flows), and other infrastructure improvements will be available to serve new development by the time the development is constructed.

### Consistency Issue(s)

- the portions of the site to be developed.

**Consistent** - The project site would be adequately served by infrastructure components, and would not increase demand to the extent that existing services in surrounding areas would be affected.

**Consistent** - The project site would increase demand on public services. Service capacity and projected demand are analyzed in **Section 5.7 Public Services**. The project applicant would finance installation of utility infrastructure as needed to provide service to the project site. Implementation of recommended mitigation measures would ensure the proposed project pays its fair share of off-site traffic and roadway improvements.

- a. **Consistent** - As discussed in **Impact 5.1-1 Existing-Plus-Project Impacts on Study Intersections** signalized intersections currently are operating acceptably, the addition of project traffic would not result in an unacceptable level of service operation.
- b. **Consistent** - **Section 5.1 Transportation** discusses the planned improvements contained in the *Town of Tiburon Traffic Mitigation Fee Program* and the status of the program. Although the program does not address all areas that would be impacted by the proposed development, the project would not cause an immediate increase to the LOS of key intersection within the program area, and would not create a need for off-site improvements in addition to what is contained in the plan.
- c. **Consistent** - The environmental review of programmed circulation improvements is outside the scope of this Draft EIR. This project does not propose any measures that would immediately affect the LOS of operating intersection located within the planning area.
- d. **Consistent** - As discussed under **Impact 5.1-2 Cumulative Buildout-Plus-Project Impacts to Study Intersections** the proposed project would make a cumulatively considerable contribution towards significant cumulative impact on study intersections resulting from the cumulative...
### Applicable Goal / Policy | Consistency Issue(s)
---|---
buildout of the planning area. However, the proposed project does not obstruct any planning efforts to address these foreseeable cumulative issues.

#### e. Consistent - The proposed project includes construction of utility infrastructure.

### Built Environment Element – Community Design

**Goal DES-1 Preservation of Community Character.** Perpetuate the unique character of each community, including the essential design characteristics that make it attractive and livable.

**Consistent** - The project site is located in an area that features quality hillside residential development. Proposed Design Guidelines include criteria to ensure architectural styles would be compatible with surrounding development and blend in with natural features of the hillside.

**Policy DES-1.1 Address Design at the Community Level.** Use community plans to regulate building design and protect key resources. Encourage cities and towns to address design issues.

**Consistent** - The proposed project includes Architectural Design Guidelines that demonstrate consistency with the County’s Single Family Residential Design Guidelines. For more information please refer to Exhibit 4.0-4.

**Policy DES-1.2 Protect Rural Character.** Ensure that development in rural areas is consistent with local design and scale and does not detract from the open character of the landscape.

**Consistent** - The project would maintain the existing pattern of low density residential development in the area. Approximately 60 acres of land containing woodlands and other forms of natural vegetation would be dedicated as public open space, which would help maintain the rural character in the southeastern portion of the Tiburon Peninsula. Additionally the proposed Architectural Design Guidelines include design objectives that are intended to govern building bulk, mass, and scale of new residences within the project site, which will help reduce the presence of structure mass associated with the proposed development and help to preserve the rural characteristics of the community.

**Policy DES-1.4 Plan Complementary Transition Areas.** When planning areas between cities, towns, and unincorporated rural communities, ensure that development provides for a harmonious transition to complement the design characteristics of both areas.

**Consistent** - The project site is located in an unincorporated pocket located between the Town of Tiburon boundaries.
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| **Goal DES-4 Protection of Scenic Resources.** Minimize visual impacts of development and preserve vistas of important natural features. | **Inconsistent** - The following lots would be developed within areas designated by County staff as visually prominent ridgelines:  
Ridgeline A - Lot 2 (outside of building area), Lot 7 and a portion of the access road that serves Lots 7 - 9, Lot 20 and a portion of Ridge Road.  
Ridgeline C - Runs through Lots 24 and 43, and then along Mount Tiburon Road, which is fronted by Lots 35 through 38, and Lots 39 through 42.  
Ridgeline D - As proposed the majority of Ridge Road would be constructed along Ridgeline D, which is fronted by Lots 10 through 19.  
Ridgelines E and F - Only the portions of these ridges that are located within the Ridge and Upland Greenbelt area are considered to be visually prominent. No lot development is proposed for this area, however the project shows construction of a twelve inch storm drain pipe and a three inch sanitary sewer line that would run through ridgelines E and F. Furthermore, the project site would have impacts on the scenic quality of the Tiburon Ridge, which is located west of the project site within Old St. Hilary’s open space and the Tiburon Uplands Nature Preserve. |
| **Policy DES-4.1 Preserve Visual Quality.** Protect scenic quality and views of the natural environment - including ridgelines and upland greenbelts, hillsides, water, and trees from adverse impacts related to development. | **Inconsistent** - As previously mentioned the proposed project includes Design Guidelines that would help insure the project maintains a high level of residential design if developed. However, as discussed in **Section 5.8 Visual Quality**, the project would result in significant unavoidable visual impacts on natural scenic views from Tiburon Ridge (Impact 5.8-1) Heathcliff Drive (Impact 5.8-2), and Angel Island (Impact 5.8-4). |
| **Goal DES-5 Attractive and Functional Streets and Parking Areas.** Design automobile use areas to fit the character of the community and comfortably accommodate travel by pedestrian and bicyclist, while still meeting health, safety, and emergency access needs. | **Consistent** - The project proposes narrower roads than the design standards in the MCC. Implementation of recommended mitigation measures would make the proposed project consistent with this goal and would ensure consistency with Marin County Code and Tiburon Fire Protection District standards. |
### Applicable Goal / Policy

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| Policy DES-5.1  
*Achieve Streetscape Compatibility.* Ensure that roadways, parking areas, and pedestrian and bike movement are functionally and aesthetically appropriate to the areas they serve. | Consistent - Implementation of recommended traffic and visual quality mitigation measures along with the design guidelines proposed by the applicant would make the proposed project consistent with Policy DES-5.1 |

### Built Environment Element – Energy and Green Building

| Goal EN-1  
*Decrease Energy Use.* Reduce total and per-capita nonrenewable energy waste and peak electricity demand through energy efficiency and conservation. | Consistent - As proposed the 2008 Easton Point Residential Design Guidelines residential design guidelines include energy conservation measures such as passive solar design, active solar energy, geothermal energy, and recycled or recyclable materials. Additionally the project will comply with the requirements of Marin County Ordinance No. 3492, which would require the construction of each new residence to exceed the Title 24 energy efficiency requirement by a certain percentage, at least 15 percent, that is determined by the size of the structure. |
| Policy EN-1.1  
*Adopt Energy Efficiency Standards.* Integrate energy efficiency and conservation requirements that exceed State standards into the development review and building permit process. | Consistent - The project would comply with the requirements of Marin County Ordinance No. 3492. |

### Built Environment Element – Housing

| Policy HS-1.3  
*Hold Neighborhood Meetings.* Developers of any major project will be encouraged to have neighborhood meetings with residents early in the process to undertake problem solving and facilitate more informed, faster, and constructive development review. | Consistent - On Thursday, January 29, 2009 Marin County representatives held a public scoping session at the Tiburon Town Hall to receive input on the scope of analysis for this Draft EIR. |
| Policy HS-2.1  
*Create an Effective Design* Review proposed new housing to achieve excellence in development design in an effective process. | Consistent - Final residential designs have not been submitted at this point in the development review process. Conceptual designs and the project’s proposed design guidelines show consistency with this policy. |
| Policy HS-2.2  
*Promote Design That Fits into the Neighborhood Context.* Enhance neighborhood identity and sense of community by designing all new housing to be sensitive to and compatible with the scale and form of the surrounding area. | Consistent - As proposed the project would be a low density single family residential development, which is consistent with development in the surrounding area. |
### Applicable Goal / Policy

**Policy HS-2.3 Follow Housing Design Principles.** The intent in the design of new housing is to provide stable, safe, and attractive neighborhoods through high-quality architecture, site planning, and amenities that address the following principles:

- **a. Reduce the Perception of Building Bulk.** In multi-unit buildings, require designs that break up the perceived bulk and minimize the apparent height and size of new buildings, including the use of upper-story step-backs and landscaping. Ensure a human scale in new development and, when possible, create multi-family buildings that have the appearance of gracious single-family homes. Windows and doors, for example, are an important element of building design and an indicator of overall building quality.

- **b. Recognize Existing Street Patterns.** Incorporate transitions in height and setbacks from adjacent properties to respect adjacent development character and privacy. Design new housing so that it relates to the existing street pattern and creates a sense of neighborliness with surrounding buildings.

- **c. Enhance the Sense of Place by Incorporating Focal Areas.** Design new housing around natural and/or designed focal points, emphasized through direct pedestrian/pathway connections. Respect existing landforms, paying attention to boundary areas and effects on adjacent properties.

- **d. Minimize the Visual Impact of Parking and Garages.** Discourage home designs in which garages dominate the public façade of the home (i.e., encourage driveways and garages to be located to the side of buildings and recessed, or along rear alleyways or below the building in some higher-density developments).

- **e. Use Quality, Energy Efficient Building Materials.** Building materials should be high quality, long lasting, durable, and energy efficient.

### Consistency Issue(s)

The applicant has not submitted specific design plans for the proposed homes. However, the project does include proposed Design Guidelines that include criteria that would help maintain consistency with the design principles of Policy HS-2.3 as follows. Enforcement of the guidelines contained in the proposed Easton Point Design Guidelines.

- **a. Consistent -** The proposed Design Guidelines that would reduce the perception of building mass include keeping the design of proposed homes to primarily one to one-and-a-half stories and limiting second story elements so that there roofline would be below the upper elevation of the lot. The Design Guidelines also include hillside design principles to minimize the prominence of structural height, bulk and massing by incorporating the following: low profile one- and two-story levels stepped down hillsides to conform to the surrounding natural terrain, design that accomplishes a low-slung horizontal silhouette by integrating deck and foundation design into the shape of the building and site topography, and utilization of low pitched and gabled and hip roofs.

- **b. Consistent -** The project proposed new homes adjacent to existing residences where Ridge Road and Mountain View Drive would be extended to provide access to new lots. The Design Guidelines call for new homes to take into account existing design elements from existing neighborhoods to ensure a seamless transition between neighborhoods.

- **c. Consistent -** The Design Guidelines call for homes to be designed to visually blend with the surrounding natural topography.

- **d. Potentially Inconsistent -** The Design Guidelines do not specify any criteria that would help ensure consistency with policies to minimize the visual impact of garages. They do call for garages at lower elevations to be sited close to streets for easy vehicle access, and garages at higher elevations to be sited to minimize use of retaining walls and avoid excessive grading. This criterion could result in garages located at a more prominent location on lots, close by the residences façade. The County’s design review process will consider
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<td>the visual impacts of proposed parking areas and garages, and should minimize the visual impact of these features.</td>
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<tr>
<td>e. <strong>Consistent</strong> - The Design Guidelines call for sustainable design methods that include energy conservation design, and the use of recycled or recyclable building materials to the greatest extent possible.</td>
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<tr>
<td><strong>Policy HS-2.4 Conserve Resources.</strong> Promote development patterns and construction standards that provide resource conservation by encouraging residential site planning, housing types and designs that use sustainable practices and materials, cost-effective energy conservation measures, and fewer resources (water, electricity, etc.), and therefore cost less to operate over time, supporting long-term housing affordability for occupants.</td>
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<td><strong>Consistent</strong> - The proposed Architectural Design Guidelines for the project call for the use of sustainable design measures, including passive solar design / active solar energy where neighbors are not unreasonable affected thereby, geothermal energy / energy conservation design, use of recycled or recyclable building materials, and a prohibition on wood burning stoves.</td>
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<td><strong>Policy HS-2.5 Employ Renewable Energy Technologies.</strong> Promote the use of sustainable and/or renewable materials and energy technologies (such as solar and wind) in new and rehabilitated housing when possible.</td>
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<tr>
<td><strong>Consistent</strong> - As stated above the proposed Architectural Design Guideline call for sustainable development measures including renewable technologies.</td>
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<tr>
<td><strong>Policy HS-3.1 House Local Workers.</strong> Strive to provide an adequate supply and variety of housing opportunities to meet the needs of Marin County’s workforce and their families, striving to match housing types and affordability with household income.</td>
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<td><strong>Inconsistent</strong> - The proposed project would not provide a “variety” of housing opportunities. It is anticipated that custom homes would be designed for each lot, and that the home value would be at the very high end of the housing market.</td>
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<td><strong>Policy HS-3.19 Follow an Inclusionary Housing Approach.</strong> Require developments with two or more dwellings to provide a percentage of units on-site for very low, low, and moderate income housing; developments with two to four units may pay an in-lieu fee. The units provided through this policy are intended for permanent occupancy and must be deed restricted, including but not limited to single-family housing, multi-family housing, condominiums, townhouses, locally</td>
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<td><strong>Not Applicable</strong> - As stated in the 2007 Judgment Pursuant To Stipulation 19 enforcing the 1976 judgment, the County of Marin will assume responsibility for affordable housing requirements, as there were no such requirements in 1976.</td>
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<td>approved licensed care facilities, stock cooperatives, or land subdivisions.</td>
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<tr>
<td><strong>Policy HS-3.21 Meet Inclusionary Requirements.</strong> The primary intent of the inclusionary requirement is the construction of new units on-site with the focus being multi-family housing developments with deed restrictions to support long periods of affordability. Second priority for meeting inclusionary requirements shall be the construction of units off-site or the transfer of land and sufficient cash to develop the number of affordable units required within the same community or planning area. If these options are not practical, then other alternatives of equal value, such as in-lieu fees or rehabilitation of existing units, may be considered.</td>
<td>Not Applicable - As stated in the 2007 Judgment Pursuant To Stipulation enforcing the 1976 judgment, the County of Marin will assume responsibility for affordable housing requirements, as there were no such requirements in 1976.</td>
</tr>
<tr>
<td><strong>Policy HS-3.23 Require Payment of In-Lieu Fees.</strong> Payment of in-lieu fees will be accepted only when it is determined that transfer of land and/or dedication of units would provide fewer affordable housing units than could be obtained by the expenditure of in-lieu fees on affordable housing development within the planning area. Fees will be calculated based on the cost of land and improvements for unit development and evaluated every other year.</td>
<td>Not Applicable - As stated in the 2007 Judgment Pursuant To Stipulation enforcing the 1976 judgment, the County of Marin will assume responsibility for affordable housing requirements, as there were no such requirements in 1976.</td>
</tr>
<tr>
<td><strong>Policy HS-3.26 Require Second Units in New Development, Require some second units (unequal duets) and occasional duplexes as part of new single-family subdivision development where four or more new units are proposed.</strong></td>
<td>Potentially Inconsistent - The proposed 2008 Easton Point Residential Development does not indicate any intention to provide second units. Although it should be noted that when plans are submitted for individual residences those may include second units within the floor plans.</td>
</tr>
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<tr>
<th>Applicable Goal / Policy</th>
<th>Consistency Issue(s)</th>
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<tr>
<td><strong>Built Environment Element – Transportation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Policy TR-1.4 Share the Costs for Improvements.</strong> Require new development to pay or otherwise improve its fair share of the transportation system impacts.</td>
<td>Consistent - The applicant would be required to pay applicable development impact fees and pay the project’s fair share of off-site infrastructure improvements.</td>
</tr>
<tr>
<td><strong>Policy TR-1.5 Require Necessary Transportation Improvements.</strong> Require necessary transportation improvements to be in place, or otherwise guaranteed to result in their timely installation, before or concurrent with new developments. In evaluating whether a transportation improvement is necessary, the County shall consider alternatives to the improvement consistent with Policy TR-1.1, Manage Travel Demand, and the extent to which the improvement will offset the traffic impacts generated by proposed and expected development and restore acceptable traffic levels of service.</td>
<td>Consistent - Section 5.1 Transportation discusses transportation improvements that would be constructed as part of this project. All roads necessary to serve the proposed project would be constructed by the applicant. Impacts to traffic safety are discussed with Impact 5.1-3 Safety Impact Due to Inadequate Sight Distances Approaching the Unsignalized Intersection of Paradise Drive with Project Access Roads. Proposed mitigation to reduce this safety impact would be completed by the applicant.</td>
</tr>
<tr>
<td><strong>Policy TR-1.8 Reduce Vehicle Miles Traveled (VMT).</strong> Reduce the rate of increase for total vehicle miles traveled by single-occupant automobile to not exceed the population growth rate.</td>
<td>Potentially Inconsistent - Given the location of the project site future residents are expected to rely on private vehicles for local travel trips. The Tiburon Ferry and Golden Gate Transit offer alternative modes of transportation that may be used by future residents for travel to work and some shopping trips. Overall private vehicles are expected to be the primary mode of transportation.</td>
</tr>
<tr>
<td><strong>Goal TR-2 Increased Bicycle and Pedestrian Access.</strong> Expand bicycle and pedestrian facilities and access in and between neighborhoods, employment centers, shopping areas, schools, and recreational sites.</td>
<td>Consistent - The proposed project does not include any improvements that would facilitate bicycle and pedestrian access. Implementation of recommended traffic mitigation measures would provide a pedestrian path within the project, but bicyclists would have to share proposed residential streets with vehicles. However, there are no bicycle paths serving the project site and Paradise Drive is designated as a Class III bicycle route. Therefore, the use of local streets by bicyclists is consistent with bicycle route classifications in the project area.</td>
</tr>
<tr>
<td><strong>Policy TR-2.2 Provide New Bicycle and Pedestrian Facilities.</strong> Where appropriate, require new development to provide trails or roadways and paths for use by bicycles and/or on-street bicycle and pedestrian facilities. In-lieu fees may be accepted if warranted in certain cases.</td>
<td>Consistent - As mentioned above, the proposed project as mitigated would include pedestrian facilities and the use of new local roads by bicyclists is consistent with the designated Class III bicycle routes on Paradise Drive.</td>
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<td>Applicable Goal / Policy</td>
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<tr>
<td><strong>Built Environment Element – Noise</strong></td>
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<tr>
<td><strong>Goal NO-1 Protection from Excessive Noise.</strong> Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.</td>
<td>Inconsistent - As discussed under Impact 5.3-1 Construction Noise, proposed mitigation measures would reduce the effects of construction noise on existing residences in the vicinity of the project site. However, construction noise levels would substantially exceed existing ambient noise levels. Therefore noise levels may impair quality of life during the construction of the site.</td>
</tr>
<tr>
<td><strong>Policy NO-1.1 Limit Noise from New Development.</strong> Direct the siting, design, and insulation of new development to ensure that acceptable noise levels are not exceeded.</td>
<td>Consistent - The proposed land use would be compatible with the surrounding area. As discussed in Section 5.3 Noise, future use of the proposed residences would not generate noise levels that exceed the ambient noise levels neighboring residences are currently exposed to.</td>
</tr>
<tr>
<td><strong>Policy NO-1.3 Regulate Noise Generating Activities.</strong> Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.</td>
<td>Consistent - Although construction noise would result in a significant unavoidable impact, the project would include measures (Mitigation Measure 5.3-1) that would reduce the effects of construction noise on adjacent residences.</td>
</tr>
<tr>
<td><strong>Built Environment Element – Public Facilities and Services</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Policy PFS-1.1 Require Cost-Sharing</strong> Require new development to pay for the infrastructure it requires and the public services it receives.</td>
<td>Consistent - The proposed 2008 Easton Point Residential Development includes construction of infrastructure, including roads and utilities, needed to serve the project. Additionally, prior to issuance of building permits, the applicant would pay miscellaneous development impact fees including fees for local school districts, fire department, hook-up fees for the Sanitary Sewer District, traffic mitigation fees, fair share of off-site transportation improvements, and meter fees for the Marin Municipal Water District.</td>
</tr>
<tr>
<td><strong>Policy PFS-1.4 Reduce Demand on Public Facilities.</strong> Reduce per capita and total demand for water and wastewater treatment, and enhance storm water management through integrated and cost-effective design, technology, and demand reduction standards for new development and redevelopment.</td>
<td>Consistent - The proposed 2008 Easton Point Residential Development would comply with water conservation measures required by the Marin Municipal Water Districts. Sanitary District #5 has adequate capacity available to serve the project. The installation of low flow toilets would reduce wastewater flows.</td>
</tr>
<tr>
<td>Applicable Goal / Policy</td>
<td>Consistency Issue(s)</td>
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<tr>
<td>Policy PFS-2.2 Mitigate Increased Water Demand in New Development. Work with local water agencies to mitigate increases in water demand due to new development by supporting water efficiency programs that decrease demand by a similar amount.</td>
<td>Consistent - The proposed 2008 Easton Point Residential Development would comply with water conservation measures required by the Marin Municipal Water District. This includes the installation of low flow shower heads and toilets, as well as landscaping with drought tolerant plant species.</td>
</tr>
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</table>

**Built Environment Element – Planning Areas**

| Policy PA-6.2 Designate Land Use on the Tiburon Peninsula. Single-Family residential densities shall range from 7 units per acre to 1 unit per 5 acres. Multi-family residential densities shall range from 1 to 4 units per acre. Planned residential density shall range from 1 unit per 1 to 10 acres. Land within Tiburon’s sphere of influence, such as the unincorporated islands along Paradise Drive, should be considered for annexation to the Town prior to development and should be developed in accordance with Town land use policies and densities. | Consistent - The project site has a gross density of one housing unit per 2.55 acres of land (43 housing units). Taking into consideration the density provisions of the Ridge and Upland Greenbelt Area the range of housing units permitted on the PR designated portion of the property (105.5 acres) would be 10 to 42 housing units, the area designated SF6 (4.5 acres) has a density range of 18 to 31 units. The total designated density range for the project site, including the RUG, is 28 to 73 housing units. In addition to residential development 59.92 acres would be designated as open space. While the proposed development does not include annexation into the Town of Tiburon, it should be noted the proposed density of the project is consistent with the prescribed density found in the Town of Tiburon General Plan, which allows a maximum density of 0.4 residences per acre (44 housing units). |

**Socioeconomic Element – Historical and Archaeological Resources**

<p>| Policy HAR-1.3 Avoid Impacts to Historical Resources. Ensure that human activity avoids damaging cultural resources. | Inconsistent - There are no known historical resource at the project site. If subsurface resources are unearthed during construction Mitigation Measure 5.9-1 contains mitigation measures that ensure consistency with Policy HAR-1.3. However, the Keil Cove property down slope of the project site appears to have the potential to meet the CEQA definition of a historic resource and is considered a historic resource for the purpose of evaluating cultural resources in the Draft EIR. The Lands of Keil, a private land holding within the project site, contains a spring that is the historic water source for the Keil gardens and pond The proposed project has the potential to eliminate the flow of water from the spring and would reduce the flow of seasonal ground water to the |</p>
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<tr>
<td>Keil Cove property. Implementation of recommended mitigation measures would assure a continued water supply to the Keil Cove property for landscape irrigation, but the potential loss of water from the spring is an impact on the historic resource.</td>
<td></td>
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</table>
4.2 MARIN COUNTY DEVELOPMENT CODE

County zoning of the majority of the project site is Residential, Multiple Planned, 0.2 units per acre (RMP-0.2). The permitted density in the RMP-0.2 district is one unit per five acres. The RMP zoning district is intended for a full range of residential development types within the unincorporated urban areas of the County. Permitted uses in this district include single-family, two-family dwellings, multifamily residential development and limited commercial uses in a suburban setting.

A small portion of the project site (northeast of where Spanish Trail Road intersects the project site) is Residential, Single-family (R1). The R1 zoning district is intended for areas suitable for single-family residential neighborhood development in a suburban setting, along with similar and related compatible uses. The minimum lot area in the R1 zoning district is 7,500 square feet.

An asterisk on the County’s zoning map refers to a note on the map that states “this zoning was modified by Court Order”.

The proposed project includes an application to rezone the project site to the Residential, Single Family Planned District (RSP). The RSP zoning district is intended for areas suitable for single-family residential neighborhood development in a suburban setting, along with similar and related uses. The proposed rezoning is consistent with the CWP’s existing residential land use designation and residential density for the subject property. Therefore the proposed rezoning would not require a CWP amendment.

Exhibit 4.0-3 assesses the consistency of the 2008 Easton Point Residential Development with the Marin County Development Code.
## Exhibit 4.0-3
### Consistency with Marin County Development Code

<table>
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<th>Applicable Goal / Policy</th>
<th>Consistency Issue(s)</th>
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<tr>
<td><strong>CHAPTER 22.10 - RESIDENTIAL DISTRICTS</strong></td>
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<tr>
<td>Section 22.10.020(D) RSP (Residential, Single-Family Planned) District.</td>
<td><strong>Consistent</strong> - As stated, the RSP zoning district is intended for single-family residential use, where site characteristics require particular attention to design detail through the Master Plan process. The proposed development is consistent with the intention of the RMP zoning district, and includes a proposed Master Plan and Precise Development Plan.</td>
</tr>
<tr>
<td><strong>Section 22.10.030 Table 2-3 - Allowed Uses and Permit Requirements for RSP.</strong></td>
<td><strong>Consistent</strong> - Only single-family residential uses are proposed. The proposed 2008 Easton Point Residential Development would be consistent with the allowed uses and permit requirements of the RSP district.</td>
</tr>
<tr>
<td><strong>Section 22.10.040 Table 2-5 - Residential District Development Standards (RSP) - Minimum Lot Area.</strong></td>
<td><strong>Not Applicable</strong></td>
</tr>
<tr>
<td><strong>Section 22.10.040 Table 2-5 - Residential District Development Standards (RSP) - Maximum Residential Density.</strong></td>
<td><strong>Consistent</strong> - A note on the zoning map states “this zoning was modified by Court Order”. The proposed residential density is consistent with the referred Court Order.</td>
</tr>
<tr>
<td><strong>Section 22.10.040 Table 2-5 - Residential District Development Standards (RSP) - Minimum Setback Requirements:</strong></td>
<td><strong>Consistent</strong> - Based on the proposed lot sizes the minimum side and rear setbacks can be met.</td>
</tr>
<tr>
<td><strong>Section 22.10.040 Table 2-5 - Residential District Development</strong></td>
<td><strong>Consistent</strong> - The Precise Development Plan proposes a</td>
</tr>
</tbody>
</table>
### Applicable Goal / Policy

<table>
<thead>
<tr>
<th>Standards (RSP) - Maximum Floor Area Ratio (FAR) 0.30.</th>
<th>Consistency Issue(s)</th>
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<tr>
<td>Maximum floor area ratio of 0.30 throughout the development.</td>
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<tr>
<th>Section 22.10.040 Table 2-5- Residential District Development Standards (RSP)- Height Limits</th>
<th>See discussion of section 22.16.030(K) below.</th>
</tr>
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</table>

### CHAPTER 22.16 - PLANNED DISTRICT DEVELOPMENT STANDARDS

#### Section 22.16.030 - Planned District General Standards

**Section 22.16.030(C) Subdivision, residential density.** The minimum lot area for new subdivisions, and the maximum density for residential projects within the planned districts, shall be evaluated for consistency with the Marin Countywide Plan and shall be determined through the processes of Master Plan, Precise Development Plan, and Tentative Map approval, rezoning the site, and shall be shown on the Zoning Map.

**Consistent** - The project proposes 43 residences on lots that are a half acre or larger. Two separate CWP land use designations overlay the project site. (1) The Planned Residential (PR) land use designation encompasses approximately 105.5 acres, the density range would allow ten to 105 housing units on the site. (2) The Single Family 6 (SF6) land use designation encompasses approximately 4.5 acres, the density range would allow 18 to 31 housing units on the site. Overall the density ranges would allow for 28 to 136 housing units on the site. As discussed in **Section 3.1 Site Location and Land Uses**, approximately 70 acres of the project site is located in the County’s Ridge and Upland Greenbelt Area, where the CWP has programs directing housing densities be calculated at the lowest end of the density range in order to protect views of Ridge and Upland Greenbelt areas. The proposal to construct 43 residences is closer to the midpoint of the allowable density range. Therefore the proposed project is consistent with the density provisions of the CWP. Furthermore, it should be noted the 1976 U.S. District Court Judgment determined the development of 43

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### Applicable Goal / Policy

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<td>single family residences on minimum one-half acre lots would be consistent with the goals of the Marin Countywide Plan.</td>
</tr>
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</table>

**Section 22.16.030(D).** The minimum setback requirements, floor area ratio, maximum site coverage, height limits, and other development standards, applicable to a site in a planned district, shall be determined through Master Plan or Precise Development Plan (Chapter 22.44), or Design Review (Chapter 22.42), as applicable.

**Consistent -** The proposed 2008 Easton Point Residential Development includes a Precise Development Plan that would establish a variety of development regulations applicable to the project site. This includes the proposed *Easton Point Design Guidelines*, which provide criteria for design, energy conservation, landscaping, and development standards such as floor area and building height limits. Each home would be subject to Design Review approval on an individual basis.

**Section 22.16.030(E) Access:**

1. **Roads.** In ridge land areas designated by the *CWP*, roads shall be designed to rural standards. (Generally, not more than 18 feet pavement width, depending on safety requirements. A minimum of 16 feet may be permitted in certain very low use areas, as provided in the improvements standards established in compliance with Title 24, Sections 24.04.020 et seq. of the County Code (Roads). No new roads shall be developed where the required grade is more than 15 percent unless the review authority determines that the roads can be built without environmental damage, comply with State fire safety regulations, and be used without public inconvenience.

2. **Driveways.** Driveways shall be designed in compliance with Title 24, Sections 24.04.240 et seq. of the County Code (Driveways). Driveway length shall be minimized, consistent with the clustering requirements of following subsection F.1.

**Inconsistent -** As discussed under Impact 5.1-11 Provision of Safe On-Site Roads, the proposed design of on-site roads would not meet certain standards related to the width of proposed roads. The applicant has requested an exception stating the nonconforming elements have been proposed in order to minimize the extent of earthwork and impervious surfaces. Implementation of recommended roadway access mitigation measures would make the proposed project consistent with the Title 24 road standards.

**Consistent -** The Precise Development Plan proposes the use of common driveways, which is encouraged in Section 24.04 of the *County Development Code*. Mountain View Drive would be a 16 feet wide driveway that serves Lots 1, 2, and 3. Two other 16 feet wide common driveways are proposed as access to Lots 7, 8, and 9 (from Ridge Road), and Lots 21, 22, and 23 (from Paradise Drive). The 16 feet driveway widths preclude the need for turnouts, and

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4.0 Relationship to Public Plans

2008 Easton Point Residential Development Draft EIR

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<th>Applicable Goal / Policy</th>
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<tr>
<td>Section 22.16.030(F) Building Location:</td>
<td>hammerhead turnarounds are proposed where required by driveway length. Driveway transitions, approaches, and surfacing would be consistent with the requirements of the County Code.</td>
</tr>
</tbody>
</table>

1. **Clustering Requirement.** Structures shall be clustered in the most accessible, least visually prominent, and most geologically stable portions of the site, consistent with needs for privacy where multiple residential units are proposed. Clustering is especially important on open grassy hillsides; a greater scattering of buildings may be preferable on wooded hillsides to save trees. The prominence of construction shall be minimized by placing buildings so that they will be screened by existing vegetation, rock outcroppings or depressions in topography. In agricultural areas, residential development shall be clustered or sited to minimize possible conflicts with existing or possible future agricultural uses.

2. **Development near ridgelines.** No construction shall occur on top of, or within 300 feet horizontally, or within 100 feet vertically of visually prominent ridgelines, whichever is more restrictive, unless no other suitable locations are available on the site. If structures must be placed within this restricted area because of site constraints, they shall be in locations that are the least visible from adjacent properties and view corridors.

3. **Energy Conservation.** Solar access shall be considered in the location, design, height and setbacks of all buildings. Generally, buildings should be oriented in a north/south fashion with the majority of glazing on the south wall or walls of the buildings.

4. **Noise Mitigation.** Noise impacts on residents in nearby areas shall be minimized through the placement of buildings, recreation areas, roads and landscaping.

1. **Inconsistent -** The project site consists of open grass lands and live oak forest. Generally, grasslands dominate higher elevations and forested areas are located at lower elevations, nearer to Paradise Drive. The project proposes to develop some homes in forested areas where vegetation would provide screening. However, the majority of homes would be located at higher elevations in areas that are visually prominent.

2. **Inconsistent -** The proposed project would result with encroachments into setbacks from visually prominent ridgelines. This would include the Tiburon Ridge, where proposed Lots 5 through 10, 20, 24, and 35 through 43, where proposed building footprints encroach within the 100-feet vertical setback from Tiburon Ridge. The proposed water tank on Parcel C would encroach within the 300-feet horizontal setback from the Tiburon Ridge. Also, as discussed in Section 4.1 Marin Countywide Plan, there are six visually prominent ridgelines located on the project site with which the proposed development would encroach into setbacks.

3. **Consistent -** The proposed Easton Point Design Guidelines call for energy conserving design elements including passive solar design and the use of solar panels. Other energy conserving design elements are encouraged.

4. **Consistent -** The project would result in construction related noise impacts (Impact 5.3-1). However, upon
### Applicable Goal / Policy

### Consistency Issue(s)

| Section 22.16.030(G) Facilities. Where possible, facilities and design features called for in the Marin Countywide Plan shall be provided on the site. These include units with three or more bedrooms, available to households with children; child-care facilities; use of reclaimed wastewater; use of materials; siting; and construction techniques to minimize consumption of resources such as energy and water; use of water-conserving appliances; recreation facilities geared to age groups anticipated in the project; bus shelters; design features for bicycle paths to accommodate people with disabilities linked to City-County systems; and facilities for composting and recycling. | Consistent - As proposed the project includes design guidelines to minimize consumption of energy, water, and other materials. |

| Section 22.16.030(H) Landscaping. Introduced landscaping should be designed to minimally disturb natural areas, and shall be compatible with the native plant setting. Landscaping plans should be prepared in compliance with Chapter 22.26 (Landscaping). Landscaping plans should consider fire protection, solar access, the use of native and drought tolerant plant species and minimal water use. Planting should not block scenic views from adjacent properties or disturb wildlife trails. | Consistent - The proposed Architectural and Landscape Design Guidelines include guidelines for landscape design that would be incorporated into the developments CC&R’s and enforced by a homeowners association. The proposed guidelines require utilization of native plant species and the retention of existing trees and native vegetation where possible. The guidelines would prohibit the use of invasive species and require the use of drought tolerant and fire resistant species for new plantings. Furthermore, the CC&R’s would remind homeowners that landscape plans should be reviewed by the Tiburon Fire Protection District for conformance to fire safety regulations. |

| Section 22.16.030(I) Exterior Lighting. Exterior lighting visible from off-site should be allowed for safety purposes only, shall consist of low-wattage fixtures, and should be directed downward and shielded to prevent adverse lighting impacts on nearby properties, subject to the architectural and landscape design guidelines for the development. | Consistent - As stated in Mitigation Measure 5.8-6 all light sources shall be downcast and shielded from off-site view. Low intensity, indirect light sources, and motion-activated lighting systems would be encouraged. Floodlighting shall be |

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24 *Architectural and Landscape Design Guidelines for Easton Point, Easton Point – Project Narrative, op. cit.*
### Applicable Goal / Policy

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<td>approval of the Director.</td>
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### Section 22.16.030(J) Open Space Areas:

1. **Open space dedication.** Land to be preserved as open space may be dedicated in fee title to the County or other agency designated by the County before issuance of any construction permit, or may remain in private ownership with appropriate scenic and/or open space easements/agreements granted to the County in perpetuity. The County may require reasonable public access across those lands remaining in private ownership, consistent with Federal and State law.

2. **Maintenance.** The County or other designated public agency will maintain all open space lands accepted in fee title, as well as public access and trail easements across private property. Open space lands that remain in private ownership with scenic easements shall be maintained in compliance with the adopted policies of the Marin County Open Space District and may require the creation of a home owners' association or other organization to maintain the private open space.

3. **Open space uses.** Uses in open space areas shall be in compliance with policies of the Marin County Open Space District. Generally, uses shall have no or minimal impact on the natural environment. Pedestrian and equestrian access shall be provided where possible and reasonable.

### Section 22.16.030(K) Project design:

1. **Height limits for structures.**
   
   a. 30 feet for primary structures, 15 feet for accessory structures; and

   b. The floor level of the lowest floor shall not exceed 10 feet above natural grade at the lowest corner.

   1a. **Consistent** - The proposed project includes dedication of a 59.60 acre parcel as public open space. An additional 0.33 acre parcel would be dedicated as a Marin dwarf flax preserve, not intended for public access. As proposed the project would include some public access easements, however public access issues can be finalized during the public hearing process for the Master Plan and Precise Development Plan application.

   2. **Consistent** - If accepted Marin County would assume responsibility for maintaining the land in compliance with adopted policies of the Marin County Open Space District. Implementation of mitigation measures contained in the EIR would require the establishment of an applicant or property owner funded open space monitoring and maintenance program to be carried out by or under the direction of the MCOSD or other public or private entity acceptable to the County.

   3. **Consistent** - If accepted as public open space or protected under the provisions of an Open Space easement, the Marin County Open Space District would have jurisdiction to enforce their policies for open space management.

   1b. **Consistent** - The applicant has submitted conceptual design schemes that generally depict the appearance the new Easton Point Design Guidelines would limit primary structure heights to 25 feet for residences accessed from the Hill Haven neighborhood and 30 feet for residences accessed from Paradise Drive. Proposed height limits for accessory structures would be 15 feet.
### Applicable Goal / Policy

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<td>c.</td>
<td>Where a ridge lot is too flat to allow placement of the house in compliance with Subsection F.2 above, the maximum height shall be 18 feet.</td>
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<tr>
<td>d.</td>
<td>Where allowed, agricultural accessory structures located below ridgetops may exceed the above height limits with Design Review approval.</td>
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<tr>
<td>e.</td>
<td>These requirements may be waived by the Director if the Director determines site terrain features make the above height limits ineffective, or unnecessary in minimizing the visibility of the proposed structures.</td>
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#### 2. Materials and Colors

Building materials and colors shall be chosen to blend into the natural environment unobtrusively, to the greatest extent possible.

### Consistency Issue(s)

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<td>homes would have. This includes schematic cross-section drawings that show how the homes would be situated on the sites topography. As depicted in the schematic cross-section drawings the proposed residences would utilize a terraced layout, which features structures layered along the topography. Lower levels would be dug into the hillside to reduce the appearance of structure mass. The schematic cross-section show the floor levels of lower story would be within ten feet of natural grade.</td>
</tr>
<tr>
<td>1c.</td>
<td>Inconsistent - The proposed Easton Point Design Guidelines do not indicate a structure height reduction where structures would encroach into ridgeline setbacks.</td>
</tr>
<tr>
<td>1d.</td>
<td>Consistent - There are no agricultural structures proposed for this project.</td>
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<tr>
<td>1e.</td>
<td>Can not determine consistency - This policy refers to discretionary authority of County staff.</td>
</tr>
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</table>

#### 2. Consistent

- The proposed Easton Point Design Guidelines encourage the use of materials and colors which visually blend with the natural environment that surrounds the project site. The design guidelines include a sample material and colors board that includes stone colored slate roofing, earthtone stucco plaster and synthetic siding, and stone materials for walls, wall base, curbs, and paved areas.

### Section 22.16.030(L) Site preparation:

1. **Grading.** Grading shall occur in compliance with Title 23, Chapter 23.08 (Excavating, Grading and Filling) of the County Code, but shall be held to a minimum. Every reasonable effort shall be made to retain the natural features of the land: skylines and ridgetops, rolling land forms, knolls, native vegetation, trees, rock outcroppings, and watercourses. Where grading is required, it shall not create flat planes and sharp angles.

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| 1. | Inconsistent - As discussed in Section 5.4 Geology and Soils, it is estimated that the proposed project, along with the requirements of Mitigation Measure 5.4-1 (Landsliding), would require a significant amount of grading. This would include grading on visually prominent ridgelines and other natural features of the hillside. Even if the project grading could avoid creating flat plans and sharp angles, the amount of grading involved would substantially alter the natural features.
### Applicable Goal / Policy

1. **Relationship to Public Plans**
   - Angles of intersection with natural terrain. Slopes shall be rounded and contoured to blend with existing topography.

2. **Drainage.** Areas adjacent to creeks shall be maintained in their natural state as much as possible. All construction shall ensure drainage into the natural watershed in a manner that will avoid significant erosion or damage to adjacent properties. Impervious surfaces shall be minimized.

3. **Trees and vegetation.** Every effort shall be made to avoid tree removal, or changes or construction that would cause the death of existing trees, rare plant communities, and wildlife habits.

4. **Fire hazards.** Development shall be permitted in areas subject to wildfire threat only where the review authority determines there is adequate access for fire and other emergency vehicles, an adequate water supply, a reliable fire warning system, and fire protection service. Setbacks for firebreaks shall be provided if necessary. Projects shall comply with State fire safe requirements including defensible space and residential construction techniques.

5. **Geologic Hazards.** Construction shall not be permitted on identified seismic or geologic hazard areas such as on slides, on natural springs, on identified fault zones, or on bay mud without approval from the Department of Public Works, based on acceptable soils and geologic reports.

6. **Watershed areas.** All projects within water district watershed areas shall be referred to the affected district for review and comment. Damaging impoundments of water shall be avoided.

<table>
<thead>
<tr>
<th>Consistency Issue(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Consistent</strong> - There are five ephemeral streams located on the project site. While development avoids most of these watercourses, proposed landslide repairs in the vicinity of proposed Lot 16 would occur within the 100 foot setback requirement called for in the CWP’s SCA policies. Mitigation Measures would reduce impacts to water quality, erosion, and sedimentation to less-than-significant levels.</td>
</tr>
<tr>
<td>2. <strong>Consistent</strong> - It is estimated that the proposed project and compliance with required fuel reduction measures to reduce the threat of fire would require the removal of 742 trees and the loss of 7.4 to 12.3 acres of coast live oak woodland.</td>
</tr>
<tr>
<td>3. <strong>Consistent</strong> - As discussed in Section 5.7 Public Services emergency vehicle access within the project site would be enhanced by expanded turnout along the proposed residential streets, and also the emergency vehicle access road. Mitigation Measure 5.7-1(b) requires preparation of an emergency radio coverage improvement plan. The project site falls within the jurisdiction of the Tiburon Fire Protection District (TFPD), which has indicated it would be able to serve the project site. The TFPD and MMWD will review the subdivision improvement plans to insure adequate water supply for fire fighting is available. The project would comply with the 2003 Urban Wildland Code, which requires vegetation management plans and adherence to stronger minimum structure standards. Vegetation management plans would comply with defensible space requirements for fire safety.</td>
</tr>
<tr>
<td>4. <strong>Consistent</strong> - The project site is underlain with 28 landslides. The project’s geotechnical engineer has submitted a geotechnical report documenting how existing landslides on the hillside, and would be inconsistent with the intent of this policy.</td>
</tr>
<tr>
<td>Applicable Goal / Policy</td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
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<tr>
<td>the project site would be remediated to adequately protect</td>
</tr>
<tr>
<td>the project site is not located within a watershed area of</td>
</tr>
<tr>
<td>the project site is not located within a watershed area of</td>
</tr>
<tr>
<td>the Marin Municipal Water District.</td>
</tr>
<tr>
<td>Section 22.16.030(M) Utilities. Street lights in ridge land</td>
</tr>
<tr>
<td>areas shall be of low intensity and low profile. Power and</td>
</tr>
<tr>
<td>telephone lines shall be undergrounded in all areas, where</td>
</tr>
<tr>
<td>feasible.</td>
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<tr>
<td>Section 22.16.030(N) Plan consistency. Project approval</td>
</tr>
<tr>
<td>shall require findings of consistency with the Marin</td>
</tr>
<tr>
<td>Countywide Plan and any applicable Community Plan that may</td>
</tr>
<tr>
<td>have more restrictive standards than the preceding provisions of this Section.</td>
</tr>
<tr>
<td>Chapter 22.20 General Property Development and Use Standards</td>
</tr>
<tr>
<td>Section 22.20.030 - Access Standards. Every structure or</td>
</tr>
<tr>
<td>use shall have frontage upon a public street or permanent</td>
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<tr>
<td>means of access to a public street by way of a public or</td>
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<tr>
<td>private easement or recorded reciprocal (mutual) access</td>
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<tr>
<td>agreement, as determined by the Director. Driveways</td>
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<tr>
<td>shall be developed in compliance with the standards</td>
</tr>
<tr>
<td>contained in Chapter 24.04 (Improvements) of the County</td>
</tr>
<tr>
<td>Code and applicable fire protection district regulations.</td>
</tr>
<tr>
<td>Section 22.20.040 - Archaeological and Historic Resources.</td>
</tr>
<tr>
<td>In the event that archaeological or historic resources are</td>
</tr>
<tr>
<td>discovered during any construction, construction activities</td>
</tr>
<tr>
<td>shall cease, and the Agency</td>
</tr>
</tbody>
</table>

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25 *Easton Point – Project Narrative, applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009, page 22.*
### Applicable Goal / Policy

shall be notified so that the extent and location of discovered materials may be recorded by a qualified archaeologist and disposition of artifacts may occur in compliance with State and Federal law. The disturbance of an Indian midden (a mound or deposit containing shells, animal bones, and other refuse that indicates the site was host to human settlement) may require the issuance of an Excavation Permit by the Department of Public Works, in compliance with Chapter 5.32 (Excavating Indian Middens) of the County Code.

### Consistency Issue(s)

A. **Consistent** - The proposed project does not include final design plans for the single family residences. The proposed *Easton Point Design Guidelines* would require, to the greatest extent reasonable, sustainable design features including passive solar design and other energy conserving design elements and use of recycled or recyclable building materials.

B. **Consistent** - The proposed *Easton Point Design Guidelines* limit accessory building structure heights to 15 feet.

### Section 22.20.045 - Energy Efficiency

The following standards shall be applied to development projects requiring discretionary permits for the purpose of incorporating efficient and sustainable energy use in the design and / or location of new buildings and structures:

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>The project design includes cost-effective features that foster energy and natural resource conservation while maintaining compatibility with the prevailing architectural character of the area.</td>
<td>Solar access shall be considered through appropriate studies or other information verifying that proposed structures are located and/or designed for solar gain.</td>
</tr>
</tbody>
</table>

### Section 22.20.060 - Height Measurement and Height Limit Exceptions

<table>
<thead>
<tr>
<th>A. Maximum height.</th>
<th>B. Detached accessory structures.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The height of any structure shall not exceed the standard established by the applicable zoning district in Article II (Zoning Districts and Allowable Land Uses). Maximum height shall be measured as the vertical distance from grade to an imaginary plane located the allowed number of feet above and parallel to the grade.</td>
<td>A detached accessory structure shall not exceed 15 feet in height above grade. However, a detached accessory structure may be constructed to the height allowed for primary structures, by the applicable zoning district, if the accessory structure is located at least 40 feet from the front lot line.</td>
</tr>
</tbody>
</table>

A. **Potentially Inconsistent** - The proposed *Easton Point Design Guidelines* include maximum height limits that would exceed the building height limitation for homes near a ridge. With *Section 22.16.030(K)(1)(c)* which states homes near the ridge shall not exceed 18 feet in height, otherwise the proposed building height limits are in compliance with the existing RSP District standard. However, approval of the recommended Design Guidelines would establish a new standard for the subject property and future homes would be in compliance with the new standard.

B. **Consistent** - The proposed *Easton Point Design Guidelines* limit accessory building structure heights to 15 feet.
Applicable Goal / Policy

<table>
<thead>
<tr>
<th>Consistency Issue(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Consistent - As proposed the project does not include garages that would be located three feet from a side or front property line. In the event a future homeowner wishes to construct additional parking within front or side yard setbacks a building permit would be required.</td>
</tr>
<tr>
<td>D. Consistent - As stated in the proposed Easton Point Design Guidelines no fencing of lot boundaries would be permitted, but low fencing to safeguard children and pets in proximity to the home would be allowed. Fences would generally not exceed five feet in height. All fencing would be subject to design review approval.</td>
</tr>
<tr>
<td>F. Consistent - The proposed Easton Point Design Guidelines include height limits that would apply to all single family homes within the project site. However, as established by this section of the county code, future residents could request an exception to height limits by applying for a Variance or Use Permit.</td>
</tr>
</tbody>
</table>

Section 22.20.080 - Parking Requirements. Parking standards for new and existing land uses are contained in Sections 24.04.330 through .400 (Parking and Loading) of the County Code. Every structure or use created or established shall be provided with the minimum number of off-street parking and loading spaces specified in Sections 24.04.330 through .400 (Parking and Loading), and in compliance with Chapter 15.06 (Trip Reduction) of the County Code.

Consistent - Section 24.04.330 requires two parking spaces per residence. The project would comply with this requirement. The proposed Easton Point Design Guidelines state each lot must provide at least two off-street guest parking spaces in addition to two garage parking spaces.

Section 22.20.090 - Setback Requirements and Exceptions.

Consistent - The project proposes typical minimum setbacks of 25 feet for the front yard, minimum 20 feet side yard setbacks, and minimum rear yard setbacks to equal 25 percent of the lot depth. The proposed setbacks meet the minimum
### Relationship to Public Plans

#### 2008 Easton Point Residential Development Draft EIR

<table>
<thead>
<tr>
<th>Applicable Goal / Policy</th>
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</thead>
<tbody>
<tr>
<td><strong>Applicable Goal / Policy</strong></td>
<td><strong>Consistency Issue(s)</strong></td>
</tr>
<tr>
<td><strong>Section 22.20.110 - Undergrounding of Utilities.</strong> Utilities to serve proposed development shall be placed underground except where the Director determines that the cost of undergrounding would be so prohibitive as to deny utility service to the development.**</td>
<td><strong>Consistent - As proposed all utilities would be installed underground.</strong></td>
</tr>
<tr>
<td><strong>CHAPTER 22.22 - AFFORDABLE HOUSING REGULATIONS</strong></td>
<td><strong>Not applicable - The 2007 Judgment states that as an action required to implement the 1976 Judgment, “In light of the fact that no affordable housing requirements existed at the time of the 1976 Judgment, any affordable housing requirement or other inclusionary - housing mandate which is required with respect to the Martha project by the Marin Countywide Plan or any County ordinance, code, or regulation shall be assumed by the County itself, and Martha shall have no additional obligation whatsoever…”</strong>. 27</td>
</tr>
<tr>
<td><strong>Section 22.26.020 - Landscaping Plans Required.</strong> Landscaping plans shall be required for all discretionary permit application for new development unless waived by the Director.**</td>
<td><strong>Consistent - The proposed Master Plan includes a general landscape plan for the entire site, and typical landscape plans for lots proposed on Ridge Road, and Forest Glen Court (Sheet L-3). These landscape plans are conceptual and provide information on the types of plantings that are acceptable at different locations. Each new residence would be subject to Design Review approval by the County and detailed landscape plans for each residence would be required for the Design Review process.</strong></td>
</tr>
</tbody>
</table>

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27 Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, op. cit., and Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, op. cit.
### Applicable Goal / Policy

**Section 22.26.030 - Landscaping Plan Procedures.**

- **A.** A preliminary landscaping plan shall be submitted as part of the development application, and be reviewed by the Agency concurrent with the land use permit application;

- **B.** After approval of the development application, a final landscaping plan shall be prepared and submitted concurrent with the application for a Building Permit, and shall be reviewed by the Agency concurrent with the Building Permit application; and

- **C.** Landscaping plans should be prepared by a landscape professional.

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<table>
<thead>
<tr>
<th>Consistency Issue(s)</th>
</tr>
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<tbody>
<tr>
<td><strong>Consistent</strong> - Application materials include a preliminary landscape plan for the project site and typical lot landscaping. These plans are professionally prepared. Detailed landscape plans would be required as part of the Design Review process for each single family residence. Therefore, at this point of EIR preparation it appears the 2008 Easton Point Residential Development would comply with all Landscape Plan Procedures</td>
</tr>
</tbody>
</table>

**Section 22.26.040 - Landscaping Objectives.**

- **A.** *Provide visual amenities.* Landscaping should enhance the appearance of new development and surrounding areas by being designed, installed, and maintained to blend new structures into the context of an established community.

- **B.** *Provide environmental benefits.* Landscaping should be utilized to stabilize soil on hillsides, reduce soil erosion, improve air quality, reduce noise, and provide for appropriate fire protection. To the extent practical, landscaping should also use non-toxic products or integrated pest management techniques in order to minimize impacts to water quality and wildlife habitat.

- **C.** *Conserve Water.* Landscaping and related irrigation shall comply with the provisions of Chapter 23.10 (*Water Efficiency in Landscaping*) of the Marin County Code.

- **D.** *Screen incompatible land uses.* Landscaping should be

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28 *Easton Point Master Plan / Precise Development Plan / Tentative Map Sheets L-1, L-2, L-3, CSW/Stuber-Stroeh, November 2008.*
utilized to screen incompatible land uses by creating visual separation, where deemed necessary and appropriate, between land uses.

E. **Improve safety.** Landscaping should be utilized to improve pedestrian and vehicular safety by providing landscaping in proper proportion to the setting (e.g., reduced heights at intersections, driveways, etc.)

F. **Preserve the character and integrity of neighborhoods.** Landscaping should be utilized to enhance and preserve the characteristics which give a neighborhood its identity and integrity by providing a prescribed selection of trees and plant materials which are compatible with those existing in the neighborhood.

G. **Preserve native plant species.** Landscaping should be designed to use native plants as much as possible in order to preserve and/or enhance valuable plant habitats, create suitable habitats for wildlife, and protect endangered or threatened plants and animals.

H. **Preserve the number of trees in the County.** In compliance with the policies of the Countywide Plan, require the replacement of any trees proposed for removal at a minimum ratio of two new, appropriately sized and installed trees for each tree designated to be removed, unless a higher or lower replacement ratio is determined to be appropriate.

I. **Provide for fire safe landscaping.** Landscaping should utilize plant selection, placement and maintenance to provide a fire management procedures, including integrated pest management (Mitigation Measure 5.5-1(b)). The proposed design guidelines state landscaping should utilize primarily native plant species which are compatible with the surrounding natural environment of Easton Point. Introduced landscaping shall include approximately 80 percent California native species tolerant to drought, fire, and frost. Use of invasive species is prohibited. Removal of existing invasive species is required prior to installation of new landscaping. Furthermore, all new residential landscaping would be subject to review and approval by the TFPD for consistency with Firewise landscape guidelines.

C. **Consistent - As stated in the proposed Easton Point Design Guidelines 80 percent of introduced landscaping would be drought tolerant species. However Chapter 23.10 of the Marin County Code contains more detailed requirements such as water efficient irrigation hardware and incorporating Hydrozones into landscape designs.**

D. **Consistent - Proposed land uses would be consistent with existing residential neighborhoods in the surrounding community. Preliminary landscape plans do show proposed plantings that would help screen new residences, and soften their appearance when viewed from existing neighborhoods.**

<table>
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<tr>
<th>Applicable Goal / Policy</th>
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<tr>
<td>utilized to screen incompatible land uses by creating visual separation, where deemed necessary and appropriate, between land uses.</td>
<td>management procedures, including integrated pest management (Mitigation Measure 5.5-1(b)). The proposed design guidelines state landscaping should utilize primarily native plant species which are compatible with the surrounding natural environment of Easton Point. Introduced landscaping shall include approximately 80 percent California native species tolerant to drought, fire, and frost. Use of invasive species is prohibited. Removal of existing invasive species is required prior to installation of new landscaping. Furthermore, all new residential landscaping would be subject to review and approval by the TFPD for consistency with Firewise landscape guidelines.</td>
</tr>
<tr>
<td><strong>E. Improve safety.</strong> Landscaping should be utilized to improve pedestrian and vehicular safety by providing landscaping in proper proportion to the setting (e.g., reduced heights at intersections, driveways, etc.)</td>
<td><strong>C. Consistent - As stated in the proposed Easton Point Design Guidelines 80 percent of introduced landscaping would be drought tolerant species. However Chapter 23.10 of the Marin County Code contains more detailed requirements such as water efficient irrigation hardware and incorporating Hydrozones into landscape designs.</strong></td>
</tr>
<tr>
<td><strong>F. Preserve the character and integrity of neighborhoods.</strong> Landscaping should be utilized to enhance and preserve the characteristics which give a neighborhood its identity and integrity by providing a prescribed selection of trees and plant materials which are compatible with those existing in the neighborhood.</td>
<td><strong>D. Consistent - Proposed land uses would be consistent with existing residential neighborhoods in the surrounding community. Preliminary landscape plans do show proposed plantings that would help screen new residences, and soften their appearance when viewed from existing neighborhoods.</strong></td>
</tr>
<tr>
<td><strong>G. Preserve native plant species.</strong> Landscaping should be designed to use native plants as much as possible in order to preserve and/or enhance valuable plant habitats, create suitable habitats for wildlife, and protect endangered or threatened plants and animals.</td>
<td></td>
</tr>
<tr>
<td><strong>H. Preserve the number of trees in the County.</strong> In compliance with the policies of the Countywide Plan, require the replacement of any trees proposed for removal at a minimum ratio of two new, appropriately sized and installed trees for each tree designated to be removed, unless a higher or lower replacement ratio is determined to be appropriate.</td>
<td></td>
</tr>
<tr>
<td><strong>I. Provide for fire safe landscaping.</strong> Landscaping should utilize plant selection, placement and maintenance to provide a fire</td>
<td></td>
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</table>
### Applicable Goal / Policy

safe environment for individual structures, ingress, egress routes, and neighborhoods as a whole. Vegetation should not be planted in locations where, when mature, it may contact overhead power lines.

<table>
<thead>
<tr>
<th>Consistency Issue(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. <strong>Consistent</strong> - As stated in the proposed <em>Easton Point Design Guidelines</em> all trees and grasses planted within 20 feet of a street (including sidewalk curb and gutter) would require approval of Marin County Public Works Department. Landscaping would be sited and designed to avoid obstruction of site distance clearance at street corners and between driveways and approaching motorists.</td>
</tr>
<tr>
<td>F. <strong>Consistent</strong> - The proposed <em>Easton Point Design Guidelines</em> would require utilization of primarily native plant species and avoidance of invasive species. Existing native trees would be retained when possible, and existing views would be preserved.</td>
</tr>
<tr>
<td>G. <strong>Consistent</strong> - The proposed <em>Easton Point Design Guidelines</em> would require 80 percent of introduced landscaping be native species. Invasive plant species would be prohibited.</td>
</tr>
<tr>
<td>H. <strong>Consistent</strong> - <em>Impact 5.6-8 Loss of Ordinance-Size Trees</em> discusses consistency with the County’s Native Tree Preservation ordinance. With mitigation the proposed project would be consistent with the tree ordinance.</td>
</tr>
<tr>
<td>I. <strong>Consistent</strong> - Proposed landscaping would comply with defensible space requirements. Landscape plans would be subject to review by the Tiburon Fire Protection District.</td>
</tr>
</tbody>
</table>

### CHAPTER 22.27 - NATIVE TREE PROTECTION AND PRESERVATION

| Section 22.27.030 - Prohibition on Removal of Protected Trees. Protected Trees shall not be removed except in compliance with Section 22.27.050 (Exemptions), and as provided for in Section 22.27.080 (Tree Removal Permits). | **Consistent** - Implementation of the proposed project would require removal of an estimated 742 trees (*Impact 5.6-8*) and up to 12.3 acres of coast live oak woodland. However consistent with Section 22.27.040 (G), the removal of these trees has been specifically proposed as part of the Master Plan proposal. |
4.0 Relationship to Public Plans

2008 Easton Point Residential Development Draft EIR

<table>
<thead>
<tr>
<th>Applicable Goal / Policy</th>
<th>Consistency Issue(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 22.27.050 - Oak Woodland Management Guidelines.</strong> When trees are removed and/or</td>
<td>Mitigation Measure 5.6-4(a) would require that the Resource Management Plan required by Mitigation Measure 5.6-1(c) address the preservation of oak woodland habitat remaining on the project site, and be consistent with Marin County’s Oak Woodland Voluntary Management Guidelines.</td>
</tr>
<tr>
<td>management plans are prepared in compliance with this Chapter, the County’s Oak Woodland</td>
<td></td>
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<tr>
<td>Management Guidelines provided by the Agency should be taken into consideration.</td>
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</table>

**CHAPTER 22.82 - SUBDIVISION DESIGN STANDARDS**

| **Section 22.82.020 - Clustering Required in Planned Districts.** Proposed subdivisions within the planned zoning districts should be designed to cluster proposed structures in compliance with Article V and Section 22.08.040 (Agricultural District Development Standards). | Not Applicable - The clustering requirements of this section refer to Article V (Coastal Zone) and the Agricultural District Development Standards. The proposed project site is not located in the Coastal Zone or an agriculturally zoned property. |
| **Section 22.82.030 - Drainage Facilities.** Subdivision drainage facilities shall be designed and constructed in compliance with Title 24, Sections 24.04.520 (Drainage Facilities) et seq. of the County Code. | Consistent - The Precise Development Plan includes proposed improvements plans that would be subject to review and approval by the Marin County Public Works Department. |
| **Section 22.82.040 - Energy Conservation.** The design of a subdivision for which a Tentative and Final Map are required by this Article shall provide, to the extent feasible, for future passive or natural heating or cooling opportunities in the subdivisions, in compliance with Map Act Section 66473.1. | Consistent - The proposed Easton Point Design Guidelines encourages the passive solar design and harnessing active solar energy. The use of geothermal energy and energy conserving materials is also encouraged. |
| **Section 22.82.050 - Hillside Subdivision Design: (C) General Requirements.** Proposed subdivisions shall be designed so that each parcel complies with the minimum lot area requirements of this Chapter, in addition to the minimum lot area requirements of Article II (Zoning Districts and Allowable Uses) and Article V established for each zoning district. All parcels created after the effective date of this | 2. Cannot determine consistency at this time - The applicant has not provided average slope calculations using the formula contained in Section 22.82.050.C.1 (S = (L x I x 100) / A). The project plans do include an existing slope map (Sheet R.5) that uses a color legend to provide a visual representation of areas within the project site that have a slope of 0-20 percent, |
|                                                                                          |                                                                                      |

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31 Marin County Code - Title 22, Development Code: S=average slope of natural ground expressed as a percent, I=Topographic contour interval in feet, L=Sum of the length of the contour lines in feet, A=Area of the lot in square feet.
4.0 Relationship to Public Plans

<table>
<thead>
<tr>
<th>Development Code shall be related to the natural ground slope as provided by this Section. In the event of conflict between these provisions and applicable minimum lot area standards of Articles II or V, the larger minimum lot area standards shall be required where a minimum lot area applies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Minimum lot area based on slope. The minimum lot area requirements established by Table 6-1 (Minimum Lot Area Based on Slope) shall apply to all parcels in the unincorporated area of the County, unless any of the lot-slope requirements of Subsection D apply. The natural ground slope calculation of a site shall be rounded up to the nearest whole number shown on Table 6-1 (Minimum Area Based on Slope).</td>
</tr>
<tr>
<td>3. Lot design. Unconventional lot design to meet lot-slope requirements shall not be permitted. All lots shall be developable, buildable, and reasonably accessible. Lots shall not be created which are impractical for improvement due to steepness of terrain, location of water courses, inability to handle waste disposal, or other natural or manmade physical conditions.</td>
</tr>
</tbody>
</table>

### Consistency Issue(s)

- 20-30 percent, and above 30 percent. However this does not provide an average slope for the proposed lots. Based on visual observation of Sheet R-5, it appears the proposed project is consistent with the lot area requirements of this section for the following reason: Most of the proposed lots exceed one acre, which is the largest lot area requirement for parcels with an average slope greater than 40 percent. Of the proposed lots under one acre, only a handful (Lots 9, 32, 33, 42, 43) have substantial areas with slopes that are 20 percent and above. However, without the exact average slope calculation for each lot it cannot be confirmed if the proposed project is consistent with this requirement.  

3. Consistent - None of the proposed lots are of an unconventional design. They would all be developable and reasonably accessible.

<table>
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<tr>
<th>Section 22.82.060 - Roadway Landscaping. Subdivision landscaping to enhance the natural environment and appearance of the subdivision shall, at a minimum, be designed and constructed in compliance with Title 24, Sections 24.04.750 et seq. (Trees and Landscaping) of the County Code.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent - Proposed landscape plans would be reviewed for compliance with the Marin County Code during the Design Review process.</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Section 22.82.070 - Lot Configuration and Minimum Area. Proposed subdivisions shall be designed so that all lots are in compliance with all applicable minimum lot area requirements of this Development Code. Lots should be designed with configurations that ensure each property owner can easily understand parcel boundaries, and to respect environmental and topographic conditions of the site. Irregular lot configurations that are designed solely to meet minimum lot area standards based on the lot-slope requirements contained in Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent - As proposed the 2008 Easton Point Residential Development would exceed the minimum lot area requirements of the County Development Code (except where a consistency determination could not be made regarding Section 22.82.050). The proposed design includes lots that area easily identifiable, developable, and accessible.</td>
</tr>
</tbody>
</table>
22.82.050 (Hillside Subdivision Design) shall not be permitted. Lots shall not be approved unless they are developable, buildable, and reasonably accessible. Lots shall not be created which are impractical for improvement, due to steepness of terrain, location of water courses, inability to handle waste disposal, or other natural or manmade physical conditions. Lots which do not comply with minimum lot size requirements can only be approved in conjunction with a rezoning. In addition to the provisions of this Chapter, lot design shall comply with those standards established by:

A. Article II (Zoning Districts and Allowable Land Uses);
B. Article V (Coastal Zones – Permit Requirements and Development Standards);
C. The Zoning Maps (Section 22. 06.030 (Zoning Map Adopted)); and
D. Title 24, Chapter 24.07 (Lots) of the County Code.

Section 22.82.080 - Road, Sidewalks, Pathways, Driveways.
Subdivision roadways, sidewalks, pedestrian and multipurpose pathways, and individual driveways shall be designed and constructed in compliance with all applicable provisions of the County Code.

Consistent - All easement dedications would comply with the requirements of the Marin County Code.

Section 22.82.090 - Utilities. Subdivision utilities shall comply with Title 24, Sections 24.04.840 et seq. (Utilities) of the County Code. Utilities to serve proposed development shall be placed underground except where the Director determines that the cost of undergrounding would be so prohibitive as to deny utility service to the development, or the environmental benefit of allowing utilities to be placed above ground outweighs potential visual impacts.

Consistent - Proposed utilities would be installed underground.

CHAPTER 22.98 - DEDICATIONS, RESERVATIONS, EASEMENT

Section 22.98.030 - Easement Dedications. Wherever the provisions of this Article Result in requirements for the dedication of easements to the County for the purposes of common driveways, drainage,

Consistent - All easement dedications would comply with the requirements of the Marin County Code.
### Applicable Goal / Policy

| Pedestrian walkways, bicycle or equestrian paths, slopes, public utilities, emergency access, limiting access to specific streets, or other purposes, the dedications shall comply with all applicable provisions of Title 24, Chapters 24.05 (Easements) and 24.06 (Reserved Strips) of the County Code. |

### Consistency Issue(s)

| Consistent - The proposed project includes dedication of public open space. However, the project would be required to pay parkland dedication in-lieu fees, as no parkland would be dedicated on site. |

| Consistent - The proposed project includes dedication of public open space. At this time Marin County has not requested other land dedications. |

| Consistent - The proposed project includes a combination of public and private access easement that would be dedicated as conditioned for approval of the project. |

### CHAPTER 22.100 - SUBDIVISION IMPROVEMENT AND AGREEMENTS

| Consistent - The applicant proposes, as part of the Precise Development Plan, basic infrastructure improvements required to serve the project. As discussed in Section 5.7 Public Services, sewer service would be provided by Sanitary District No. 5, and water service would be provided by the Marin Municipal Water District. |

| Consistent - Section 5.4 Geology and Soils contains an analysis of subdivision grading and proposed mitigation measures to insure adequate erosion and sediment control. |

---

**Section 22.98.040 - Parkland Dedications and Fees.**

**Section 22.98.060 - Reservation of Land.** As a condition of approval of a Tentative Map, the County may require the subdivider to reserve sites appropriate in area and location for parks, recreational facilities, fire stations, libraries or other public uses, in compliance with the standards and formulas in this Chapter.

**Section 22.98.070 - Right-of-Way Dedication.** As a condition of approval of a Parcel or Final Map, the subdivider shall dedicate or make an irrevocable offer of dedication of all parcels of land or easements within the subdivision that are needed for streets or alleys.
### Applicable Goal / Policy

**Section 22.100.040 - Soils Reports.** Geotechnical reports shall be provided by the subdivider as required by this section.

### Consistency Issue(s)

*Consistent* - Geotechnical reports have been submitted for the proposed project. **Section 5.4 Geology and Soils** contains an analysis of geology and soils at the project site.
4.0 Relationship to Public Plans

2008 Easton Point Residential Development Draft EIR

4.3 MARIN COUNTY SINGLE FAMILY RESIDENTIAL DESIGN GUIDELINES

The County would use the *Marin County Single Family Residential Design Guidelines* to review the design review/precise development plan application for each individual Easton Point lot assuming approval, or conditional approval, of a Master Plan. **Exhibit 4.0-4** assesses the consistency of the 2008 Easton Point Residential Development with the *Marin County Single Family Residential Design Guidelines*. 
### Exhibit 4.0-4

**Consistency with Marin County Single Family Residential Design Guidelines**

<table>
<thead>
<tr>
<th>Design Guidelines</th>
<th>Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A-1.1 Tree/Vegetation Removal.</strong> Development should be sited to minimize the removal of natural vegetation, including trees, except where required to maintain defensible space for the residence and nearby structures.</td>
<td><strong>Inconsistent</strong> - Overall 742 trees would be removed to accommodate the proposed development. Although many of the proposed removals would be required in order to meet fire safety requirements, such as maintaining defensible space as called for in the FireSafe Marin practices, the project would still require a substantial amount of tree removals to accommodate building footprints, new roads, landslide remediation and site preparation measures.</td>
</tr>
<tr>
<td><strong>A-1.2 Drainage.</strong> The site design should include features that avoid or minimize increases in storm water runoff. The following includes a summary of key principles to use in development of a site plan that would create opportunities to use a wide variety of simple design techniques to infiltrate significant amounts of runoff, improve aesthetics, and reduce development costs.</td>
<td><strong>Consistent</strong> - The proposed project would utilize a storm drain design that includes detention basins to minimize increases to stormwater runoff. These are discussed in detail in <strong>Section 5.5 Hydrology and Water Quality.</strong></td>
</tr>
<tr>
<td><strong>A-1.3 Streams.</strong> The site design should acknowledge the importance of streams and riparian systems by maintaining sufficient setbacks from streams and by using best management practices.</td>
<td><strong>Consistent</strong> - There are five ephemeral drainageways located on the project site. The design of the proposed project avoids development within the areas of these streams.</td>
</tr>
<tr>
<td><strong>A-1.4 Grading.</strong> Changes to the existing natural terrain through grading should be kept to a minimum in order to preserve the inherent characteristics of the site.</td>
<td><strong>Inconsistent</strong> - The proposed project would require extensive grading for construction of roads, construction access road, homes and landslide repair.</td>
</tr>
<tr>
<td><strong>A-1.5 Road Access.</strong> Streets, driveways, parking and emergency vehicle access should be aligned to conform, as closely as possible, to existing grades and should minimize the need for grading of slopes.</td>
<td><strong>Consistent</strong> - As proposed, roads would generally conform to existing grades.</td>
</tr>
<tr>
<td><strong>B-1.1 Building Setbacks and Stepbacks.</strong> In order to improve the relationship between properties where sideyard setbacks are typically the only separation between structures and to maintain adequate space, light,</td>
<td><strong>Consistent</strong> - As proposed the 2008 Easton Point Residential Development would feature low density single family development on large (minimum half acre) parcels. Although building footprints</td>
</tr>
</tbody>
</table>
### Design Guidelines

and a sense of openness, upper level “stepbacks” should be incorporated into the design of residences. Stepbacks should not result in a stacked box design that does not reflect the surrounding community character.

<table>
<thead>
<tr>
<th><strong>Consistency</strong></th>
<th><strong>Design Guidelines</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>are conceptual at this stage of project review, it appears each lot would have sufficient setback distances from neighboring parcels.</td>
<td>and a sense of openness, upper level “stepbacks” should be incorporated into the design of residences. Stepbacks should not result in a stacked box design that does not reflect the surrounding community character.</td>
</tr>
<tr>
<td><strong>C-1.1 Street Setbacks.</strong> New development and remodel/additions should not be disharmonious with the existing street setback patterns.</td>
<td>Consistent - The proposed development would establish a street setback pattern that is suitable for this type of development.</td>
</tr>
<tr>
<td><strong>C-1.2 Hillside Street Stepbacks.</strong> On hillside properties with average slopes of 25% or greater, varied and staggered front building setbacks are encouraged. This is consistent with the natural hillside character and will reduce the monotony of repetitive setbacks. The amount of setback variation will depend upon lot size. Residential development at a density of 2 dwellings per acre or less should vary adjacent setbacks by at least 10 feet; lots one acre or larger should vary adjacent setbacks by larger distances if feasible.</td>
<td>Consistent - As proposed the development follows the natural characteristics of the hillside topography. The proposed development does not feature standard rectangular block residential designs. The tentative map design is customized to utilize natural building areas where possible. The need to establish a varied street side setback is not as great as with higher density developments.</td>
</tr>
<tr>
<td><strong>C-1.3 Hillside Interior Setbacks.</strong> All new hillside residential development should be located so as to minimize interference with privacy between properties and views from adjacent residences.</td>
<td>Consistent - As proposed the project provides adequate interior setback and provides for adequate privacy.</td>
</tr>
<tr>
<td><strong>C-1.4 Garages.</strong> The location and orientation of the garage in smaller lot neighborhoods should be designed to minimize its visual presence as seen from the adjoining street.</td>
<td>Consistent - Although final design plans for each new residence have not be provided, the conceptual designs show that garages are designed to blend in with the homes.</td>
</tr>
<tr>
<td><strong>C-1.5 Parking Areas.</strong> On hillside properties with average slopes of 25 percent or greater, parking spaces should be placed within a reasonable distance from the dwelling unit which they serve while allowing for preservation of natural topography, trees and other significant vegetation, as well as privacy and noise attenuation for neighboring residences.</td>
<td>Consistent - Conceptual designs show that houses use a linear footprint that can follow along hillside topography and is conducive to allowing detached sections, such as garages, as necessary to prevent disruption of topography.</td>
</tr>
<tr>
<td><strong>C-1.6 Window Location and Size.</strong> Upper level indoor and outdoor spaces should be designed so that windows, outdoor deck areas, balconies, doors, and exterior lighting do not impair privacy on adjacent properties.</td>
<td>Consistent - The preliminary / conceptual building footprints for the proposed lots would be spread out throughout the development, which would minimize privacy impacts.</td>
</tr>
<tr>
<td><strong>C-1.7 Fences and Retaining Walls.</strong> The heights of fences and retaining walls should be minimized to avoid creating continuous fenced or walled property frontages that create a “canyon effect” along residential streets.</td>
<td>Consistent - On-site road construction would require the construction of retaining walls. Wall heights and lengths would vary as needed. Individual lot development would likely require construction of</td>
</tr>
<tr>
<td><strong>Design Guidelines</strong></td>
<td><strong>Consistency</strong></td>
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<tr>
<td>Open fence designs are encouraged on public streets to emphasize opportunity for views from the public environment. Large retaining walls in a uniform plane should be avoided by breaking retaining walls into smaller components and landscaped terraces.</td>
<td>retaining walls. Based on the Master Plan / Precise Development Plan efforts have been made to minimize the heights of the retaining walls and there would not be a “canyon effect” along the roads.</td>
</tr>
<tr>
<td><strong>C-1.9 Mechanical Equipment (Visual).</strong> Mechanical equipment should be screened from public view. Enclosures should be designed to be integral with the architecture and landscape character of the other parts of the property.</td>
<td><strong>Consistent</strong> - The project proposes large single family residential lots and would not utilize much mechanical equipment. The proposed Architectural Design Guidelines call for the use of solar panels, but also state that they will be utilized so not to disturb neighboring residences.</td>
</tr>
<tr>
<td><strong>C-1.10 Mechanical Equipment (Noise).</strong> Air conditioning equipment, swimming pool equipment and other facilities that may generate noise should be located a sufficient distance from property neighboring lines to avoid or minimize noise intrusion.</td>
<td><strong>Consistent</strong> - Neighboring properties would be located an adequate distance away, and would not be disturbed by noise from adjacent properties.</td>
</tr>
<tr>
<td><strong>C-1.11 Exterior Lighting.</strong> Site lighting in hillside residential development should comply with the following additional requirements.</td>
<td><strong>Consistent - Section 5.8 Visual Quality</strong> discusses light pollution (Impact 5.8-6), and recommends mitigation measures that require a lighting plan with light sources shielded from off-site view, lights shall be downcast, escape of light to the atmosphere shall be minimized, low intensity, indirect light source shall be encouraged, motion-activated lighting systems shall be encouraged, the use of low-level bollards, prohibition of floodlights and other measures.</td>
</tr>
<tr>
<td>- Site lighting that is visible from adjacent properties, public roadways, and from other neighborhoods must be indirect of incorporate full shield cut-offs.</td>
<td></td>
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<tr>
<td>- Overhead lighting should be placed at the lowest elevation necessary for safety purposes. The placement of lighting in residential parking areas should avoid interference with bedroom windows. Overhead fixtures used for pedestrian areas should provide shielded downlighting and be limited to heights below 8 feet. Lower mounting heights are encouraged.</td>
<td></td>
</tr>
<tr>
<td>- Along walkways, low level lighting in the form of bollards or fixtures mounted on short posts is encouraged. Please refer to Figure C-11. Shatterproof coverings are recommended. Posts should be located to avoid hazards for pedestrians or vehicles.</td>
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<tr>
<td>- Exterior flood lighting for security and safety should be located and shielded so as not to shine on adjacent properties. Whenever</td>
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<tr>
<td>Design Guidelines</td>
<td>Consistency</td>
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<td>possible, such lighting should be set on a timer and/or motion detector. Decorative lighting to highlight a structure or landscape feature (e.g. tree, site retaining wall, etc.) could interfere with the hillside silhouette and nightscape and is discouraged.</td>
<td></td>
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</tbody>
</table>
4.4 PARADISE DRIVE VISIONING PLAN

The Paradise Drive Visioning Plan was prepared by Marin County together with the residents of and the neighborhoods along Paradise Drive. The Paradise Drive Visioning Plan includes goals and actions for the following topics:

- Parks, Recreation and Open Space
- Land Use
- Traffic
- Public Safety and Utilities
- Sewers and Wastewater Treatment
- Annexation
- Governance
- The Romberg Center

Although never formally adopted by the Marin County Board of Supervisors the Paradise Drive Visioning Plan is intended to be used as a basis for the community to petition for action on part of governmental agencies and respond collectively to issues that affect the vision for the community.

Exhibit 4.0-5 discusses whether or not the 2008 Easton Point Residential Development meets the intent of the goals and actions of the Paradise Drive Visioning Plan. Since the plan was not adopted by Marin County it will not be necessary for the Board of Supervisors to make findings of consistency with the plan.

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32 Paradise Drive Visioning Plan, The Marin County Community Development Agency - Planning Division, February 1999. The Paradise Drive Visioning Plan was accepted by the Marin County Board of Supervisors February 9, 1999.

33 Ibid., page 3.
**Exhibit 4.0-5**  
**Paradise Drive Visioning Plan**

<table>
<thead>
<tr>
<th>Visioning Goals / Actions</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal I-2</strong> To provide safe and convenient local pathways for pedestrians within the community.</td>
<td>The proposed project fronts along Paradise Drive, and would construct one road and one driveway off Paradise Drive. Mitigation measures are proposed to enhance safety for pedestrian, bicyclist, and vehicle traffic. These include grading and construction to provide a minimum of 158 feet of sight distance at both new intersections (Mitigation Measure 5.1-3), pavement improvements and re-striping with consideration to allow turnouts where opportunities exist on both sides of Paradise Drive (Mitigation Measure 5.1-6), and efforts to provide for the maximum amount of widening, with a minimum four feet shoulder for bicycle safety, and provide refuge areas for pedestrians (Mitigation Measure 5.1-7). However the project and mitigation measures do not provide for detached pedestrian pathways along Paradise Drive, which is the intent of Goal I-2.</td>
</tr>
<tr>
<td>Explore opportunities for providing local pathways near the road as a safe convenient alternative to walking on the side of Paradise Drive.</td>
<td></td>
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</tbody>
</table>

| **Goal I-3** To use a variety of techniques to maintain the rural character of the Paradise Drive area, including taxation for public open space acquisition to preserve land from development. | |
| Maintain a pattern of low density residential development. 34 | The proposed project would consist of large single family homes on lot sizes that range from 0.55 acre (Lot 43) to 2.25 acres (Lot 6). The project would subdivide 110 acres into 43 residential lots, which would result in a density of approximately one unit per 2.5 acres. The proposed density is similar to the pattern of low density development existing along Paradise Drive. The project also proposes 59.92 acres of open space, which would provide a buffer between the groups of proposed residences, and help to preserve the rural hillside appearance along Paradise Drive. |

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34 *Goal II-1* designates low density as one unit per 2.5 acres.
<table>
<thead>
<tr>
<th>Visioning Goals / Actions</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preserve trees, vegetation, and other natural features that contribute to the area’s rural visual appearance.</td>
<td>It is estimated the proposed development would require removal of 742 trees in order to accommodate building footprints and comply with requirements to reduce vegetative fuels that present a wildland fire hazard. Furthermore the project includes development within significant ridgeline areas. As proposed the project does include the dedication of 59.92 acres of land as public open space, which includes a variety of vegetated habitat that would be perpetually preserved. Furthermore, the proposed project includes development within areas that have been determined to be significant ridgelines. The ridgelines serve as a natural feature that hints at having a transition between urban development and open space. Countywide Plan policies that call for the preservation of scenic ridgelines also require a minimum setback of 300 horizontal feet (horizontal distance from) and 100 vertical feet from visually prominent ridgelines. As proposed, lot development would encroach into these setback areas for five ridgelines located on the project site that have been determined by county staff to be visually prominent.</td>
</tr>
<tr>
<td>Maintain the rural visual character of the hillsides and provide visual access to the Bay.</td>
<td>The dedication of approximately 60 acres of public open space will help preserve rural visual character of the hillside. The project proposes to develop 43 single family homes on large lots in a manner that would avoid the visual clutter associated with higher density development. The proposed Design Guidelines call for view preservation, which will help preserve visual access to the bay from the project site. The majority of proposed homes are located uphill from Paradise Drive, which will help preserve the rural appearance along the roadway. Although the project would change the visual appearance of the project site form adjacent open space lands, view access to the Bay would not be blocked.</td>
</tr>
<tr>
<td>Maintain a pattern of residential development (homes within a rural landscape) to promote the rural character.</td>
<td>The project is located north of higher density single family homes located within the Town of Tiburon, and provides a transition to lower density single family homes located further north of the town boundaries. As proposed the project site would be consistent with the</td>
</tr>
<tr>
<td>Visioning Goals / Actions</td>
<td>Discussion</td>
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</tr>
<tr>
<td>Limit the bulk and mass of new residential structures.</td>
<td>Conceptual design plans have been prepared to provide an idea of what the 43 residences could look like. However each home would feature a custom design and be subject to Design Review approval on an individual basis. The proposed <em>Easton Point Design Guidelines</em> provide some guidelines for hillside design to minimize structure height, bulk, and massing. These include</td>
</tr>
<tr>
<td></td>
<td>• low profile one and two story homes steeped down hillsides to conform to natural terrain,</td>
</tr>
<tr>
<td></td>
<td>• integrating deck and foundation design into the shape of the building and site topography, and</td>
</tr>
<tr>
<td></td>
<td>• utilizing low-pitched and gabled and hip roofs.</td>
</tr>
<tr>
<td></td>
<td>• Exterior walls should be composed of a series of smaller horizontal and vertical planes to break up the visual massing of the buildings and reflect the irregular terrain of the Easton Point site.</td>
</tr>
<tr>
<td></td>
<td>• Excessive cantilevers and overhangs should be avoided on downhill elevations</td>
</tr>
<tr>
<td>Design homes in a rural style to blend into the existing landscape.</td>
<td>The proposed <em>Easton Point Design Guidelines</em> encourages the use of common design elements throughout the development. The proposed conceptual design features a craftsman style with slate stone roofing, stone exterior wall materials, and a natural color palette for other siding and wall materials. The conceptual materials and colors will create rural style residences that blend in well with the existing landscape.</td>
</tr>
<tr>
<td>Maintain the current rural circuitous alignment of Paradise Drive while providing for traffic, bicycle, and pedestrian safety improvements.</td>
<td><em>Section 5.1 Transportation</em> discusses traffic, bicycle, and pedestrian safety on Paradise Drive and proposes mitigation measures, listed above under Goal I-2, that would reduce the projects impacts on these</td>
</tr>
<tr>
<td>Visioning Goals / Actions</td>
<td>Discussion</td>
</tr>
<tr>
<td>---------------------------</td>
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</tr>
<tr>
<td><strong>Goal II-1 To preserve the rural character along Paradise Drive.</strong></td>
<td></td>
</tr>
<tr>
<td>On larger, subdividable parcels of land, continue the current designation of low and very low density development, with low density defined as 1 unit per 2.5 acres and very low density as 1 unit per 10 acres or lower.</td>
<td>Proposed density range is 1 housing unit per every 2.5 acres.</td>
</tr>
<tr>
<td>Recognize and protect the differences in rural character of the areas north and south of Trestle Glen. The area south of Trestle Glen will continue to have a much more rural character than the area to the north.</td>
<td>The proposed development would be consistent with existing development along Paradise Drive south of Trestle Glen Boulevard. As design the proposed development would hide residences, by reducing their presence along Paradise Drive.</td>
</tr>
<tr>
<td>Plan new development to minimize the number of roadways and driveways onto Paradise Drive for safety and to reduce the need for grading and paving.</td>
<td>The proposed project would construct one road and one driveway off Paradise Drive. Ten residences would have access via Forest Glen Court and a new driveway would provide access to Lots 21 through 23. The remainder of the lots (30) would have access via existing streets.</td>
</tr>
<tr>
<td>Maintain rural road standards with low intensity street lighting and no sidewalks.</td>
<td>The project does not proposed to construct any sidewalks but street lights would be provided.</td>
</tr>
<tr>
<td><strong>Goal II-2 To reduce the visual impact of new development.</strong></td>
<td></td>
</tr>
<tr>
<td>Continue using planned district zoning which encourages clustering and sitting of development to minimize visual and environmental impacts.</td>
<td>The project site is located in area zoned planned district.</td>
</tr>
<tr>
<td>Locate new development away from ridges and visually prominent subridge areas.</td>
<td>There are several visually prominent ridgelines located within the project site plus Tiburon Ridge is located nearby. County staff has determined all or portions of the six of the on-site ridgelines are visually prominent. As proposed the project would include construction of new homes within the area of these visually prominent ridgelines plus Tiburon Ridge.</td>
</tr>
<tr>
<td><strong>Goal III-1 To maintain the rural character and configuration of Paradise Drive and improve safety for all users.</strong></td>
<td></td>
</tr>
<tr>
<td>Create a system of off-road neighborhood paths for residents to use as an alternative to walking on the side of the road.</td>
<td>The project proposes a road for construction vehicle access that could connect the proposed Forest Glen Court to the upper reaches of the project site. This road potentially could be used as a pedestrian</td>
</tr>
</tbody>
</table>
### Visioning Goals / Actions

**Discussion**

<table>
<thead>
<tr>
<th><strong>Goal III-2  To develop and maintain an accurate information base about existing and projected future traffic conditions to make well-informed decisions about land use and transportation.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore the possibility of improving the safety of Paradise Drive through more turnouts for passing, shoulder widening and paving, and speed bumps.</td>
</tr>
<tr>
<td>Request the County and Tiburon to conduct traffic studies to project cumulative amounts of traffic from future development…Studies should include an evaluation of the capacity of Paradise Drive and whether the roadway can support the traffic from projected growth, including bicycle traffic.</td>
</tr>
</tbody>
</table>

**Goal IV-1  To provide adequate water for household use and fire protection.**

| Investigate options and implement solutions to provide water pressure adequate for firefighting and household use throughout the planning area. | According to the MMWD, with the provision of the new water tank, water supply would be adequate for fire flow and household use. |

| When new developments are built with a requirement for a tank for water storage, explore the possibility of allowing existing residences to connect to the tank. | The applicant has stated an intent to connect the proposed water tank to the existing Hill Haven water tank in order to improve water pressure in the Hill Haven neighborhood. |

**Goal IV-2  To carry out vegetation management practices which reduce the risk of fire on public and private lands.**

| Educate private property owners about the need to manage vegetation on their property. | The Tiburon Fire Protection District would review site and building plans for individual lots and would inspect the project annually. |

**Goal IV-5 To have adequate and unobtrusive provision of utilities for all residents.**

| Underground utility lines whenever possible. | There are no existing above ground utilities at the project site. |
### Visioning Goals / Actions

- upgrading, use the opportunity to underground or install other utility lines such as telephone fiber optic, and electric power.

| Goal V-1  | To provide residents with environmentally-sound, cost-effective wastewater treatment systems. |
| Coordination between the Romberg Tiburon Center (RTC), the County Parks Department, and near by properties to upgrade wastewater treatment facilities. | Sanitary District No. 5 has recently taken action to increase the treatment capacity within it’s jurisdiction by upgrading facilities at it’s Paradise Cove treatment plant. |
| New development on large properties should be served by sewers. | The project site is proposed to be connected to wastewater collection and treatment facilities operated by Sanitary District No. 5. |
4.5 MARIN LOCAL AGENCY FORMATION COMMISSION POLICIES

The Knox-Nisbet Act of 1963 required establishment of Local Agency Formation Commissions in every California county. These state-mandated regional agencies are designed to ensure that change in government organization - such as annexations or de-annexations of land or creation of new cities or special districts to provide urban services - occurs in an orderly manner which provides efficient and quality services and preserves open space land resources.

It is the mission of the Marin Local Agency Formation Commission (LAFCo) to promote and coordinate the efficient delivery of local governmental services and to encourage the preservation of open space and agricultural lands. Furthermore, it is the intent of the Marin LAFCo to strengthen the role of city governments in the provision of urban services. In the city-centered corridor of Marin County as designated in the Marin Countywide Plan, general-purposes governments are preferred over special districts for the provision of services.

Development of the 2008 Easton Point Residential Development project as proposed requires annexation of the subject property to Sanitary District Number 5. The Marin LAFCo would be responsible to approve the annexation to Sanitary District Number 5.

Exhibit 4.0-6 assesses the consistency of the 2008 Easton Point Residential Development with the relevant policies and standards of the Marin LAFCo.
### Exhibit 4.0-6
**Consistency with Marin LAFCo**

<table>
<thead>
<tr>
<th>Marin LAFCo Policies and Procedures</th>
<th>Consistency Issue(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agricultural Lands Policies</strong></td>
<td></td>
</tr>
<tr>
<td>Land which is currently engaged in the substantial production of food, fiber, or livestock, or is identified as agricultural land under Williamson Act contract shall not be annexed to a city or a sanitary sewer agency for the purpose of promoting urban development. Development of existing vacant or non-prime agricultural lands for urban uses within a city’s and/or special district’s jurisdiction or within a city’s and/or special district’s sphere of influence should be encouraged before any proposal is approved which would allow for or lead to the development of existing agricultural or open-space lands for nonagricultural or non open-space uses which are outside of the city’s and/or special district’s jurisdiction or outside of a city’s and/or special district’s sphere of influence.</td>
<td>Consistent – the project site is not currently in agricultural production or under a Williamson Act contract. The project site is within the Town of Tiburon’s sphere of influence. Although it is not proposed to annex the project site to the Town the proposed project would not lead to the development of existing agricultural or open space lands for nonagricultural or non open space uses outside of the Town’s sphere of influence.</td>
</tr>
<tr>
<td><strong>Prezoning Policy</strong></td>
<td></td>
</tr>
<tr>
<td>As required by State Law, applicants whose proposals include annexation to a city shall obtain prezoning approval from the city prior to submitting the annexation application to the Local Agency Formation Commission for consideration. The city shall be lead agency for environmental review in such cases, and proof of environmental document and certification shall accompany the application.</td>
<td>Does not Apply – It is not proposed to annex the project site to the Town of Tiburon. In July 2009 the Town of Tiburon did prezone the project site to the Town’s RPD-04 district. 35</td>
</tr>
<tr>
<td><strong>Dual Annexation Policy</strong></td>
<td></td>
</tr>
<tr>
<td>Annexations of unincorporated land to special district that provide services necessary for urban development shall require concurrent or subsequent annexation to a city if the land is located within the city’s</td>
<td>Inconsistent – It is proposed to annex the project site to Sanitary District No. 5. This policy would require that the site be annexed to the Town of Tiburon at the same time that it is annexed to Sanitary District No. 5,</td>
</tr>
</tbody>
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35 Town of Tiburon Ordinance No. 516 N.S., adopted July 1, 2009.
<table>
<thead>
<tr>
<th>Marin LAFCo Policies and Procedures</th>
<th>Consistency Issue(s)</th>
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</thead>
<tbody>
<tr>
<td>sphere of influence. The Commission may, however, defer the requirement for annexation to the city if the Commission determines that each of the following conditions has been met:</td>
<td>unless LAFCo chooses to defer the requirement and provide for annexation to the Town at some later late. It is not proposed to annex the project site to the Town of Tiburon. The policy does, however, provide a procedure whereby the Commission can defer the requirement for annexation to the Town if certain conditions can be met. At this time adequate information is not available to determine if a request for deferral of annexation could be granted.</td>
</tr>
<tr>
<td>1. The County Board of Supervisors has adopted plans or policies specifically for the subject area that support the extension of urban services; and</td>
<td></td>
</tr>
<tr>
<td>2. All affected agencies have been notified and given adequate time to review and comment on the proposed annexation; and</td>
<td></td>
</tr>
<tr>
<td>3. Application of the policy at the present time would result in illogical boundaries or inefficient provision of local services.</td>
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</tr>
</tbody>
</table>
5.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES
5.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

This chapter contains an analysis of the environmental topics identified by Marin County’s scoping process for the EIR (Notice of Preparation and Scoping Meeting) described in Chapter 1.0 Introduction. Environmental topics addressed in this chapter include:

- 5.1 Transportation
- 5.2 Air Quality
- 5.3 Noise
- 5.4 Geology and Soils
- 5.5 Hydrology and Water Quality
- 5.6 Biological Resources
- 5.7 Public Services
- 5.8 Visual Quality
- 5.9 Cultural Resources

Sections 5.1 through 5.9 of this chapter describe existing environmental conditions as they relate to each specific topic, identify potential impacts from implementing the 2008 Easton Point Residential Development, and present mitigation measures required to reduce significant adverse impacts to a less-than-significant level. Where relevant, cumulative impacts of project buildout combined with other growth elsewhere in the study area are described in Sections 5.1 through 5.9, as discussed in Section 3.3 Cumulative Development Assumptions. Cumulative impacts are further discussed in Section 7.2 Cumulative Impacts.

FORMAT OF TOPICAL ANALYSES

Each of the topical impact assessments in this EIR (Sections 5.1 through 5.9) are organized as follows:

Environmental Setting

Existing conditions are described in the respective "setting" sections. The existing conditions are described as they existed in January 2009, the time the Notice of Preparation was published. These descriptions summarize information compiled during the study process to prepare the EIR. Background materials used in the EIR are referenced in footnotes and listed in Section 8.3 Bibliography.

Significance Criteria

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

**Impacts and Mitigation Measures**

The “impacts and mitigation” subsections identify the level and type of impacts that are likely to result from implementation of the proposed 2008 Easton Point Residential Development.

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

For each significant impact where a feasible mitigation is identified, a conclusion is provided as to whether, with the incorporation of the recommended mitigation measure the impact would be reduced to a less-than-significant level or whether it would be a Significant Unavoidable Impact. A significant unavoidable impact is a significant impact which cannot feasibly be avoided with mitigation. These include impacts which could be partly mitigated but could not be reduced to a less-than-significant level.

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

Transportation – Environmental Setting

This section describes existing transportation conditions and the methodology used to evaluate the transportation–related impacts of the proposed 2008 Easton Point Residential Development project. Existing conditions are the base by which the project is measured for environmental impacts.

During the public scoping process for the 2008 Easton Point Residential Project EIR several comments were made regarding the potential transportation impacts of the proposed project. Particularly, comments raised concerns for impacts to the hillside neighborhood streets located south and southeast of the project site, an area commonly referred to in public comments as the “old Tiburon neighborhood”. These concerns include the physical effects project traffic would have on the paved surfaces of such streets; the project’s contribution towards cumulative traffic impacts with an emphasis on existing construction vehicle traffic for current ongoing residential construction/renovation projects in the neighborhood; traffic and pedestrian safety where these streets are difficult to navigate; emergency vehicle access; and how the project would impact the capacity of these streets in the event of an emergency evacuation. Furthermore, comments urged consideration of the project’s impacts to regional roads including Tiburon Boulevard, Paradise Drive, Trestle Glen Boulevard, and U.S. Highway 101 from both new residents and construction traffic; and impacts to safety where new access is proposed off of Paradise Drive. Scoping comments are discussed in additional detail below.

CIRCULATION NETWORK

The existing circulation network in the Tiburon Planning Area consists of roads, trails, bicycle, pedestrian, bus, and ferry facilities. A description of the major transportation facilities, current traffic volumes and alternative traffic modes are included in this section.

Streets and Roads

Regional access to the Tiburon Peninsula is provided by U.S. Highway 101 (U.S. 101), a major north-south freeway linking Marin County with Sonoma County (north) and San Francisco (south). Two local access roads serve the project site:

Tiburon Boulevard (State Route 131), a two- to four-lane arterial road that extends from its interchange with U.S. 101 east to downtown Tiburon. (Its westward extension, west of U.S. 101, is East Blithedale Avenue.)

Paradise Drive, a two-lane collector road, that extends east from its interchange with U.S. 101 (located north of the Tiburon Boulevard / U.S. 101 interchange), and forms a loop around the Tiburon Peninsula by connecting to Tiburon Boulevard. The two roads connect at the eastern end of the Tiburon Peninsula (see Exhibit 3.0-1).

This EIR refers to Tiburon Boulevard and Paradise Drive as east-west roads except in the vicinity of the existing Marin Municipal Water District (MMWD) Paradise Water Tank service road (proposed Forest Glen Court) where Paradise Drive is referred to as a north-south road.
The project site is comprised of separate development areas and corresponding access which would affect the off-site road network, as follows (see Exhibit 3.0-4):

- Existing Old Tiburon and Hill Haven neighborhood streets -- Solano Street, Centro East Street, Centro West Street, Diviso Street, Vistazo East Street, Ridge Road, and Mountain View Drive would provide access to Lots 1 through 3, and Ridge Road would provide access to Lots 4 through 20, 24, and 35 through 43.

- Paradise Drive would provide direct access to Lots 21 through 23 via a new driveway intersection near the Mar East neighborhood.

- Paradise Drive would provide indirect access to Lots 25 through 34 via Forest Glen Court (proposed as a newly built road to replace the existing Marin Municipal Water District [MMWD] Paradise Water Tank service road).

Characteristics of these local and regional transportation links are summarized below. Exhibits 5.1-1 and 5.1-2 show road locations, intersection geometry and traffic control.

**U.S. 101** in the Tiburon vicinity has four lanes northbound and four lanes southbound. There are full interchanges with Tiburon Boulevard / East Blithedale Avenue and Paradise Drive / Tamalpais Drive.

**Tiburon Boulevard** has four through traffic lanes at its interchange with U.S. 101 which continue east as far as Trestle Glen Boulevard. East of Trestle Glen, the road narrows to two through lanes. It has paved and unpaved shoulders varying from zero to five feet wide until it nears downtown Tiburon at Mar West Street, where the two-lane road has been improved to accommodate on-street parking and Class II bicycle lanes. Tiburon Boulevard has signalized intersections at the U.S. 101 north- and southbound on- and off-ramps as well as at Strawberry Drive, Blackfield Drive, Trestle Glen Boulevard, Avenida Miraflores, Rock Hill Drive, San Rafael Avenue, Lyford Drive, and Beach Road. Just east of Main Street downtown, Tiburon Boulevard narrows, the Class II bicycle lanes are discontinued, and further east, the road changes name to Paradise Drive.
Exhibit 5.1-1
Existing Lane Geometrics and Intersection Control -- Western Tiburon

Source: Crane Transportation Group, 2009
Paradise Drive is a two-lane collector road that serves the eastern and northern part of the Tiburon Peninsula. It provides direct or indirect access to the project site. Paradise Drive has an intersection with Trestle Glen Boulevard mid-peninsula and a full interchange with U.S. 101 in Corte Madera (Paradise Drive / Tamalpais Drive). Between Main Street (in downtown Tiburon) and the site vicinity, the road has a variable pavement width of 18 to 28 feet. Some of the narrowest and most winding road segments are located near the project site where prevailing vehicle speeds through the sharpest curves are observed to be 15 to 25 miles per hour (mph). 1 The road has narrow shoulders of varying widths (generally zero to two feet wide) with no provision for bicycle or pedestrian traffic, and there is not sufficient pathway or paved shoulder area to allow bicycles or pedestrians to travel outside the vehicle travel lanes. Immediately west (south) of the MMWD service road (proposed Forest Glen Court), Paradise Drive carries about 20 vehicles per hour (VPH) during the AM peak traffic hour and about 45 VPH during the PM peak traffic hour. The road pavement in the project vicinity is cracked and deteriorating. Access from Paradise Drive to the project site is provided at the gated, paved service road that extends from Paradise Drive to the MMWD Paradise Water Tank.

In addition to the project site, there are approximately 850 existing parcels in the Tiburon Planning Area that can only be accessed by Paradise Drive. Subdivision of parcels in this area could result in up to another 150 parcels. 2 On a peninsula that is bisected by the Tiburon Ridge, maintaining Paradise Drive for access, including emergency access to the northeastern side of the peninsula, and as an alternative way on and off the peninsula, is critical. Most of Paradise Drive is maintained by Marin County.

Residents of the Paradise Drive area have expressed a desire to maintain Paradise Drive in the rural manner in which it currently exists. 3 This would prevent substantial changes to the character of the road. Currently, there are a number of issues surrounding Paradise Drive, including long-term jurisdiction and the cost of maintenance and improvement (road, drainage, slide repairs, and wash outs) and concerns about safety, particularly of pedestrians and bicyclists.

Lyford's Cove / Old Tiburon and Hill Haven Neighborhood streets generally are narrow and winding, and all are at most two-lanes wide. They serve older generally small-size hillside housing units in Old Tiburon and more recently built larger units at higher elevations. Vehicles accessing the project site vicinity from Paradise Drive through the Old Tiburon and Hill Haven neighborhoods, travel a winding road system via Solano Street to Centro East Street, Diviso Street, Vistazo West Street, Ridge Road, Mountain View Drive, and Straits View Drive. Alternatively, vehicles accessing the project site vicinity from Tiburon Boulevard turn left at Beach Road-Esperanza Street, travel via Centro West Street to reach Diviso Street, and then follow the same uphill route listed above. An existing problem for traffic flow along most of the neighborhood streets is that they are narrow, and even for wider segments where on-street parking is permitted along both sides of the road (such as along Ridge Road), when vehicles are parked opposite each other, the road is reduced to one narrow lane for through traffic. Road width is a major issue for residents of the neighborhood. (The Observed Operation and Safety Concerns section below discusses neighborhood streets further.) Specific characteristics of the neighborhood roads are summarized as follows:

1 Speeds observed through the sharp curve at the Paradise Drive / MMWD Water Tank service road intersection.


3 Ibid.
• **Solano Street** traverses a steep southeast-to-northwest uphill slope, connecting Paradise Drive to Centro East Street. It is 28 feet wide with curbs and gutters on both sides. The downhill curb (west side) is painted red to prohibit on-street parking. The Centro East Street approaches to Solano Street are stop sign-controlled. Solano Street just northwest of Paradise Drive is posted “Tractors and Trailers Prohibited”. No speed limit is posted on Solano Street.

• **Centro East Street** is a steep narrow road extending between Paradise Drive and Centro West Street. Centro East Street varies from about 17 feet to 20 feet wide and has no curbs or gutters on either side. Between Diviso and Solano Streets, Centro East Street is posted “No Parking Within Nine Feet of Painted Center Line”. No speed limit is posted on Centro East Street.

• **Centro West Street** is a narrow road extending between Esperanza Street and Diviso Street. Centro West Street varies from about 17 feet to 20 feet wide and has no curbs or gutters on one or both sides on the easternmost segment of the road. 4

• **Diviso Street** traverses a steep southeast-to-northwest uphill slope, connecting Centro East Street with Vistazo East Street. The road varies from about 16.5 to 19.5 feet wide and has no curbs or gutters on either side. The road pavement is bordered by shallow ditches or drops off abruptly due to existing topography. Although there is no indication of an on-street parking prohibition, the road is not wide enough to accommodate on-street parking due to the narrow width of the pavement, lack of shoulders, and close proximity of houses to the pavement edge. A speed advisory of 25 mph is painted on the road on the northbound lane near Centro East Street. The Diviso Street / Vistazo Street / St. Bernard 5 intersection has no stop or yield sign control.

• **Vistazo East and Vistazo West Streets** are narrow two-lane roads serving the Hill Haven neighborhood. Both roads dead end within the neighborhood. Both Diviso Street and Ridge Road have four-way intersections with Vistazo Street.

• **Ridge Road** traverses a steep southeast-to-northwest uphill slope, intersecting roads in the Hill Haven neighborhood. Ridge Road extends northwest (uphill) of its intersection with Vistazo West and Vistazo East Streets, turns east at its intersection with Lagoon View Drive, extends northeast through a “T” intersection with Mountain View Drive, then proceeds west from its intersection with Straits View Drive to a dead end in a 50-foot radius cul-de-sac adjacent to the project site boundary. It is 24-feet wide with either curbs and gutters or asphalt curbs on both sides. The road has no posted speed limit, and there are no stop or yield sign-controls at any intersection along Ridge Road.

• **Mountain View Drive** extends west of Ridge Road and then turns north to a dead end at the project site boundary. It is 24-feet wide with either curbs and gutters or asphalt curbs on both sides and no posted speed limit.

• **Straits View Drive** extends southeast of Ridge Road and then turns northwest, and dead ends at the project site boundary. It is 22 to 24 feet wide with either curbs and gutters or asphalt curbs on both sides and no posted speed limit.

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4 Centro West Street connects to Esperanza Street and Beach Road which provide access to and from downtown Tiburon from neighborhoods north-northeast of the downtown.

5 St. Bernard Street is a short dead end street providing access to several residences in the Hill Haven neighborhood.
• **Spanish Trail Road** extends east from Centro East Street then turns northwest and dead ends at the project site boundary. It is 20 to 24 feet wide with curbs and gutters or asphalt curbs and no posted speed limit.

No public streets currently provide direct access on the project site. A paved service road extends from Paradise Drive to the Marin Municipal Water District (MMWD) Paradise Water Tank via an access easement. A gate at the Paradise Drive / MMWD Water Tank service road intersection currently restricts use of the road. An unpaved fire road provides access from Ridge Road across the site to the adjacent Old St. Hilary’s Open Space Preserve.

**Transit Service**

Tiburon has the highest percentage of ferry commuters among Bay Area cities with ferry service; 8.4 percent of Tiburon commuters (a total of 352 residents) use the ferry as their primary means of travel to and from work.⁶ The privately funded Blue and Gold Fleet provides four morning commute trips from Tiburon to the San Francisco Ferry Building, and four return trips serving the afternoon commute. In addition, several trips each day serve the reverse commute direction and an additional seven daily trips connect with Sausalito and San Francisco’s Pier 41.

A smaller percentage of Tiburon residents (1.8 percent) commute by bus, although this figure does not capture commuters that use the bus to reach the ferry terminal. Bus service is provided by Golden Gate Transit, which is operated by the Golden Gate Bridge, Highway, and Transportation District. Service reductions in 2003 resulted in a 30 percent decrease in bus service by the District. No bus service extends as far east as the project site vicinity.⁷

Three bus routes serve Tiburon (via Tiburon Boulevard):

• Route 8 (to and from San Francisco during commute hours, every 30 minutes)

• Route 9 (between Strawberry and the ferry terminal building during commute hours, every 45 to 60 minutes)

• Route 19 (hourly service throughout the day between Marin City and Tiburon).

**Bicycle Facilities**

Caltrans standards provide for three types of bikeway facilities, as described below:

• Class I Bikeway (Bicycle Path) - provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.

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⁷ *Tiburon 2020 General Plan Draft EIR, op. cit.*
• Class II Bikeway (Bicycle Lane) - provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five feet wide. Adjacent vehicle parking and vehicle / pedestrian cross-flow are permitted.

• Class III Bikeway (Bicycle Route) - provides for a right-of-way designated by signs or pavement markings for shared use with motor vehicles.

Existing Bikeways

The existing bikeways within Marin County and the Tiburon Planning Area are:

• Class I bicycle path (Richardson Bay Linear Park Multi-Use Path) from Blackie’s Pasture to Mar West Street.

• Class II bicycle lanes on Tiburon Boulevard (east of Mar West Street) and Paradise Drive (west of Mar West Street).

Proposed Bikeways

There are several planned bikeways within Marin County and the Tiburon Planning Area:

• Class II bicycle lanes on Trestle Glen Boulevard (from Tiburon Boulevard to Paradise Drive).

• Class III bicycle routes on Tiburon Boulevard (from U.S. 101 to Greenwood Cove Road), Greenwood Cove Road and Greenwood Back Road (to Blackie’s Pasture).

• Class III bicycle route on Paradise Drive (from Mar West Street to Corte Madera) that forms a portion of the San Francisco Bay Trail.

The remote and scenic qualities of Paradise Drive, as well as its challenging curvature, make it a popular route for bicyclists. However, in most locations, Paradise Drive has insufficient shoulder and travel lane widths to allow motorists to pass cyclists, particularly when cyclists are traveling in groups. Along most of the road’s length, there is no refuge for pedestrians and bicyclists to move out of the path of passing or oncoming vehicles. Motorists frequently pass bicyclists by entering the opposing lane of traffic, oftentimes in areas with limited sight distance of on-coming traffic.

Bicycle Volumes on Paradise Drive

Crane Transportation Group (the EIR traffic analyst) counted pedestrian and bicycle activity on Paradise Drive in the vicinity of the project site during the typical weekday AM and PM peak traffic hours for motor vehicle traffic (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) in May 2009. During the AM peak hour, four bicyclists were traveling northbound, and five bicyclists were traveling southbound on Paradise Drive. During the PM peak hour, eight bicyclists were traveling northbound,

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8 Ibid., page 4.2-2.

9 A portion of Trestle Glen Boulevard currently features a five-foot path separated from the roadway by a raised curb. Although this facility may be utilized by bicyclists, inclusion of the raised curb would not be consistent with Class I or II facilities.
and six bicyclists were traveling southbound on Paradise Drive at the same location. Summer and fall weekend bicycle activity is observed to be four or five times greater than weekday activity.

For example, weekday and weekend counts were conducted by the Town of Tiburon for the *Alta Robles Draft EIR* of the number of bicyclists and motor vehicles traveling through the study area on Paradise Drive near Trestle Glen Boulevard in September 2007. Weekday observations were conducted during the typical AM and PM peak hours for motor vehicle traffic (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM), and weekend observations were conducted between the hours of 10:00 AM and 6:00 PM. Vehicles were shown to substantially outnumber bicycles during the weekday AM and PM peak hours, however, bicyclists were shown to outnumber vehicles on Paradise Drive on weekends before noon, while volumes of vehicles and bicyclists are relatively equal between noon and 1:00 PM. The counts indicated that between 80 and 136 bicyclists traveled on Paradise Drive during the weekend morning and weekend mid-day hours. By comparison, motor vehicles did not exceed 80 to 113 vehicles per hour during any hour (including weekday peak hours).

### Pedestrian Facilities

While sidewalks are provided on some arterial and collector streets, including the Richardson Bay Linear Park Multi-Use Path, most local streets in Tiburon do not have sidewalks. The majority of pedestrian crossing locations in Tiburon are uncontrolled (not signalized) including some crossings on arterial streets. There are no pedestrian facilities in the project site vicinity. The EIR traffic analyst counted pedestrian activity on Paradise Drive in the vicinity of the site during the typical weekday AM and PM peak traffic hours for motor vehicle traffic (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) in May 2009. During the AM peak hour, three pedestrians were traveling northbound, and four pedestrians were traveling southbound on Paradise Drive. During the PM peak hour, four pedestrians were traveling northbound, and four pedestrians were traveling southbound on Paradise Drive at the same location.

### Traffic Volumes

The EIR traffic analyst determined current traffic volumes by conducting weekday AM and PM commute peak traffic hour intersection turning movement counts at 15 intersections in late May 2009 while schools were still in session. Count locations were determined in consultation with County staff. The May 2009 count data were used to establish current AM and PM peak hour traffic volumes. The weekday peak hours generally were found to occur between 7:45 and 8:45 AM and 5:00 and 6:00 PM. *Exhibits 5.1-3* through *5.1-6* show existing volumes.

### Intersection Analysis

Weekday AM and PM peak commute intersection operation was evaluated at the 15 study intersections. Analyzed intersections are located along Tiburon Boulevard or East Blithedale Avenue (the western extension of Tiburon Boulevard in the Town of Mill Valley, immediately west of U.S. 101), Paradise Drive, and in the Hill Haven neighborhood (Ridge

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10 Weekday observations were conducted on Tuesday and Wednesday, September 25 and 26, 2007 and weekend observations were conducted on Saturday and Sunday, September 29 and 30, 2007. Fehr & Peers, 2007.


12 Crane Transportation Group supervised conduct of counts by All Traffic Data.
Exhibit 5.1-3
Existing AM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-4
Existing AM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-5
Existing PM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-6
Existing PM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2009
Road / Vistazo Street intersection). The level of service methodology used in this report is the current engineering profession standard. Analyzed intersections are as follows:

**Signalized Intersections**

- East Blithedale Avenue / U.S. 101 Southbound Off-Ramp
- Tiburon Boulevard / Redwood Highway Frontage Road
- Tiburon Boulevard / Blackfield Drive / Greenwood Cove Drive
- Tiburon Boulevard / Trestle Glen Boulevard
- Tiburon Boulevard / Avenida Miraflores
- Tiburon Boulevard / Rock Hill Drive
- Tiburon Boulevard / San Rafael Avenue
- Tiburon Boulevard / Lyford Drive
- Tiburon Boulevard / Beach Road

**Unsignalized Intersections**

- Tiburon Boulevard / Reed Ranch Road
- Paradise Drive / Trestle Glen Boulevard
- Tiburon Boulevard / Mar West Street
- Ridge Road / Vistazo Street
- Tiburon Boulevard / Mar East Street
- Paradise Drive / MMWD Water Tank Service Road (proposed Forest Glen Court)

**Intersection Operation** Operations for signalized and unsignalized intersections are described below.

**Signalized Intersections** Intersections, rather than road segments between intersections, are almost always the capacity controlling locations for any circulation system. For signalized intersections, the 2000 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology was utilized. With this methodology, operations are defined by the level of service and average control delay per vehicle (measured in seconds) for the entire intersection. For a signalized intersection, control delay is the portion of the total delay attributed to traffic signal operation. This includes delay associated with deceleration, acceleration, stopping, and moving up in the queue. Greater detail regarding the LOS / delay relationship is provided in Exhibit 5.1-7.

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## Exhibit 5.1-7
**Signalized Intersection Level of Service Criteria**

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description</th>
<th>Average Control Delay a (Seconds Per Vehicle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Operations with very low delay occurring with favorable progression and/or short cycle lengths.</td>
<td>&lt; 10.0</td>
</tr>
<tr>
<td>B</td>
<td>Operations with low delay occurring with good progression and/or short cycle lengths.</td>
<td>10.1 to 20.0</td>
</tr>
<tr>
<td>C</td>
<td>Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.</td>
<td>20.1 to 35.0</td>
</tr>
<tr>
<td>D</td>
<td>Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.</td>
<td>35.1 to 55.0</td>
</tr>
<tr>
<td>E</td>
<td>Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.</td>
<td>55.1 to 80.0</td>
</tr>
<tr>
<td>F</td>
<td>Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.</td>
<td>&gt; 80.0</td>
</tr>
</tbody>
</table>

a  Control delay includes initial deceleration delay, queue move-up time, stopped delay, and acceleration delay.


### Unsignalized Intersections

For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2000 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology for unsignalized intersections was utilized. For side-street stop-controlled intersections, operations are defined by the level of service and average control delay per vehicle (measured in seconds), with delay typically represented for the stop sign controlled approaches or turn movements. For all-way stop-controlled intersections, operations are defined by the average control delay for the entire intersection (measured in seconds per vehicle). The delay at an unsignalized intersection incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. Exhibit 5.1-8 provides greater detail about unsignalized analysis methodologies.
### Exhibit 5.1-8
Unsignalized Intersection Level of Service Criteria

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description</th>
<th>Average Control Delay a (Seconds Per Vehicle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Little or no delay</td>
<td>&lt; 10.0</td>
</tr>
<tr>
<td>B</td>
<td>Short traffic delays</td>
<td>10.1 to 15.0</td>
</tr>
<tr>
<td>C</td>
<td>Average traffic delays</td>
<td>15.1 to 25.0</td>
</tr>
<tr>
<td>D</td>
<td>Long traffic delays</td>
<td>25.1 to 35.0</td>
</tr>
<tr>
<td>E</td>
<td>Very long traffic delays</td>
<td>35.1 to 50.0</td>
</tr>
<tr>
<td>F</td>
<td>Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)</td>
<td>&gt; 50.0</td>
</tr>
</tbody>
</table>

a  Control delay includes initial deceleration delay, queue move-up time, stopped delay, and acceleration delay.


**Minimum Acceptable Standards**

Level of Service (LOS) standards for intersections in the Tiburon Planning Area are based on the following:

- The **Marin County Congestion Management Program** (CMP), developed by the Transportation Authority of Marin (TAM) stipulates that urban and suburban arterials within the County should operate at LOS D or better, while highways such as U.S. 101 should operate at LOS E or better. 14 The LOS is based on the weekday PM peak hour.

- The **CWP** references the CMP, stating that the Congestion Management Program, developed by TAM, is designed to ensure that roads operate at the minimum countywide standard of LOS D or better for urban and suburban arterials (State Route 1, State Route 131), and LOS E or better for U.S. 101, Interstate 580, and State Route 37. 15

- The **Tiburon General Plan** stipulates that intersections should operate at LOS C or better, with some exceptions. Exceptions include


5.1 Transportation

Tiburon Boulevard / Trestle Glen Boulevard intersection, where LOS D is allowable for the PM peak hour. 16

At the following locations near U.S. 101, LOS D is allowable for both the AM and PM peak hours.

- East Blithedale Avenue at U.S. 101 Southbound Off-Ramp.
- Tiburon Boulevard at U.S. 101 Northbound Off-Ramp.
- Tiburon Boulevard at Redwood Highway Frontage Road.
- Redwood Highway Frontage Road at Seminary Drive.
- Redwood Highway Frontage Road (Seminary Drive exit) at U.S. 101 Northbound Off-Ramp.

Existing Level of Service

Exhibits 5.1-9 and 5.1-10 show the existing level of service for each of the 15 intersections analyzed. As shown, all signalized intersections currently operate acceptably during the weekday AM and PM peak hours. Only the Reed Ranch Road / Tiburon Boulevard unsignalized (side street stop sign controlled) intersection operates unacceptably. During the AM and PM peak hours, the southbound Reed Ranch Road left turn to Tiburon Boulevard operates at LOS F with over three minutes delay during the AM peak hour, and about 1 ½ minutes delay during the PM peak hour.

Overall intersection operation is discussed under Observed Operational and Safety Concerns.

The Reed Ranch Road left turn movement, operating at LOS F, is indicative of the operation of many minor (side) streets intersecting Tiburon Boulevard where poor level of service applies to the side street stop sign-controlled minor street turning movements and indicates the lengthy delays for side street traffic turns (primarily left-turns) onto Tiburon Boulevard during the weekday commute peak traffic periods. However, based on Caltrans criteria, the current volume of side street traffic is not sufficient to warrant signalization (see the discussion of signal warrants below).

16 Town of Tiburon General Plan, Town of Tiburon, adopted September 7, 2005.
### Exhibit 5.1-9
Intersection Level of Service -- AM Peak Hour

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Southbound U.S. 101 Off-Ramp / East Blithedale</td>
<td>Signal</td>
<td>C- 20.6&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>C- 22.5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
<td>C-22.3&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>4. Reed Ranch Road / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>F-*&lt;sup&gt;b&lt;/sup&gt;/B-12.2&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>5. Trestle Glen / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-14.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>6. Avenida Miraflores / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-18.3&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>7. Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-12.0&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>8. Trestle Glen / Paradise Drive</td>
<td>Stop Sign</td>
<td>B-11.4/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>9. San Rafael Avenue / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-10.7&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>11. Mar West Street (West) / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>C-22.9/C-17.6&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.6&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>13. Vistazo Road / Ridge Road / St Bernard</td>
<td>Stop Sign</td>
<td>A-9.9/A-8.9/ A-7.3&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>14. Mar East Street / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>B-10.4&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
<tr>
<td>15. Forest Glen Court / Paradise Drive</td>
<td>Stop Sign</td>
<td>NA/NA&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>F* = Average delay exceeds 3 minutes. **Bold type** indicates unacceptable level of service.</sup>

<sup>a</sup> Signalized level of service-average vehicle delay (in seconds).

<sup>b</sup> Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.

<sup>c</sup> Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.

<sup>d</sup> Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.

<sup>e</sup> Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/ Westbound Vistazo Road approach/Southbound Ridge Road approach.

<sup>f</sup> Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.

<sup>g</sup> Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.

Source: Crane Transportation Group, 2009
### Exhibit 5.1-10

**Intersection Level of Service -- PM Peak Hour**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Southbound U.S. 101 Off-Ramp / East Blithedale</td>
<td>Signal</td>
<td>C- 21.1 (a)</td>
</tr>
<tr>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>C- 33.6 (a)</td>
</tr>
<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.8 (a)</td>
</tr>
<tr>
<td>4. Reed Ranch Road / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>F-96.5/B-12.0 (b)</td>
</tr>
<tr>
<td>5. Trestle Glen / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-14.7 (a)</td>
</tr>
<tr>
<td>6. Avenida Miraflores / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-14.9 (a)</td>
</tr>
<tr>
<td>7. Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>A-8.3 (a)</td>
</tr>
<tr>
<td>8. Trestle Glen / Paradise Drive</td>
<td>Stop Sign</td>
<td>B-11.8/A-7.6 (c)</td>
</tr>
<tr>
<td>9. San Rafael Avenue / Tiburon Boulevard</td>
<td>Signal</td>
<td>A-9.7 (a)</td>
</tr>
<tr>
<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-13.0 (a)</td>
</tr>
<tr>
<td>11. Mar West Street (West) / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>C-24.9/D-28.8 (d)</td>
</tr>
<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-18.5 (a)</td>
</tr>
<tr>
<td>13. Vistazo Road/ Ridge Road/ St Bernard</td>
<td>Stop Sign</td>
<td>A-9.6/A-9.0/A-7.3 (e)</td>
</tr>
<tr>
<td>14. Mar East Street / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>B-10.8 (f)</td>
</tr>
<tr>
<td>15. Forest Glen Court / Paradise Drive</td>
<td>Stop Sign</td>
<td>NA/NA (g)</td>
</tr>
</tbody>
</table>

**Bold type** indicates unacceptable level of service.

- **a** Signalized level of service-average vehicle delay (in seconds).
- **b** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.
- **c** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.
- **d** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.
- **e** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/ Westbound Vistazo Road approach/Southbound Ridge Road approach.
- **f** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.
- **g** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.

Source: Crane Transportation Group, 2009
**Signal Warrants**  Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds block crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e. increase the overall intersection's ability to accommodate additional vehicles) and, in fact, often slightly reduce the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in traffic accidents if installed at inappropriate locations.

There are eight possible tests for determining whether a traffic signal should be considered for installation. These tests, called “warrants,” consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. Usually, two or more warrants must be met before a signal is installed. In this EIR, the test for Peak Hour Volumes (Warrant #3) has been applied. When Warrant #3 is met, there is a strong indication that a detailed signal warrant analysis covering all possible warrants is appropriate. These rigorous analyses are described in Chapter 4 of the 2003 *Manual on Uniform Traffic Control Devices (MUTCD)*, while Warrant #3 is presented in the Appendix.

It is possible that an unsignalized intersection will not meet signal warrants, but will have one or more movements that experience LOS F operations. LOS F can be indicated for a very low volume of vehicles at a stop sign. Although these stopped vehicles may experience long delays of one minute or more, there would not be an overall benefit if the higher numbers of vehicles on the major street are stopped in favor of the few vehicles on the minor street. The signal warrant considers a balance between major street and minor street delays, and may indicate that there is overall benefit if drivers for some turn movements from the minor street continue to experience long (LOS E or F) delays.

For purposes of this EIR analysis, Warrant #3 has been checked for the unsignalized intersections of Tiburon Boulevard with Reed Ranch Road and Mar West Street where lower volume side street turning movements experience lower levels of service and delay. As volumes increase at these intersections, service levels may deteriorate below acceptable levels, and provision of a signal, when warranted, would implement the CWP policy TR-1.2 requiring maintenance of service standards, TR-1.5 requiring necessary transportation improvements (discussed below under Regulatory Framework), and comply with the transportation significance criteria listed in this section. **Exhibit 5.1-11** shows that existing volumes at these unsignalized study intersections do not meet peak hour signal warrant criteria levels.

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**Exhibit 5.1-11**

**Signal Warrants**

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing AM Peak Hour</th>
<th>Existing PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reed Ranch Road / Tiburon Boulevard</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Mar West Street / Tiburon Boulevard</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

**REGULATORY FRAMEWORK**

There are several regional agencies that have jurisdiction in regard to traffic and transportation issues. Below is a review of those agencies as well as recent planning initiatives they have taken to improve regional transportation networks.

**Metropolitan Transportation Commission**

The majority of federal, State, and local financing available for transportation projects is allocated at the regional level by the Metropolitan Transportation Commission (MTC), the transportation planning, coordinating, and financing agency for the nine-county Bay Area. The current regional transportation plan, *Transportation 2030*, specifies a detailed set of investments and strategies throughout the region from 2005 through 2030 to maintain, manage, and improve the surface transportation system. The plan specifies how anticipated federal, State, and local transportation funds will be spent in the Bay Area during the next 25 years. Most of this “committed funding” will go toward protecting the region’s existing transportation infrastructure. The Golden Gate Bridge seismic retrofit project, the Golden Gate Bridge moveable median barrier project, improvements to Sir Francis Drake Boulevard, and acquisition and upgrade of Sonoma-Marin Rail station sites are projects with committed funding. Interchange improvements at U.S. 101 and Tiburon Boulevard are included in the list of priority projects in Marin County, which is intended to be partially funded with developers’ fees.

**Bay Area Air Quality Management District**

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with the authority to develop and enforce regulations for the control of air pollution throughout the Bay Area. The Clean Air Plan is BAAQMD’s plan for reducing the emissions of air pollutants that lead to ozone. BAAQMD has also published CEQA Guidelines for the purpose of evaluating the air quality impact of projects and plans. One of the criteria that the Guidelines describe is that plans, including General Plans, must demonstrate reasonable efforts to implement transportation control measures included in the Clean Air Plan that identify local governments as the implementing agencies.

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On-road motor vehicles are the largest source of air pollution in the Bay Area. To address the impact of vehicles, the California Clean Air Act requires air districts to adopt, implement, and enforce transportation control measures.

Marin County addresses air quality management in the CWP’s Atmosphere and Climate Policies, specifically, AIR-1.1 requiring coordinated planning and evaluation efforts, AIR-1.3 requiring mitigation of air quality impacts, and AIR-4.1 and 4.2 addressing greenhouse gas emissions. The Transportation Policies of the CWP support air quality maintenance through policies such as TR-1.1 intended to improve the operating efficiency of the transportation system by reducing vehicle travel demand and providing other modes of travel, TR-1.2 requiring maintenance of service standards, TR-1.5 requiring necessary transportation improvements, and TR-1.8 encouraging reduction of the rate of increase for total vehicle miles traveled by single-occupant automobile not to exceed the population growth rate. Implementing programs TR-1.a through TR-1.u, include specific measures to promote transportation alternatives, coordinate with local agencies, monitor impacts of development and mitigation requirements, update transportation system modeling and traffic mitigation fees, establish monitoring and achieve VMT reduction through specific transportation demand management programs. Policies TR-2.1 through TR-2.4 and implementing programs TR-2.a through TR-2.n address expanding bicycle and pedestrian facilities and access in and between neighborhoods and employment centers, shopping areas, schools and recreational sites. Policy TR-3.1 and implementing programs encourage and support the expansion of local bus and ferry services and access to these services.

Transportation Authority of Marin

The Transportation Authority of Marin (TAM) is a 12-member board comprised of representatives from the Marin County Board of Supervisors and the City or Town Council of each local government in Marin County. Formerly known as the Marin County Congestion Management Agency, TAM is required to prepare, update, and monitor a Congestion Management Program (CMP) that does the following:

- Identifies a network of transportation facilities, maintains level of service standards for highways and roads, and monitors congestion levels periodically.
- Establishes performance measures to evaluate current and future multi-modal system performance for the movement of people and goods.
- Identifies and encourages alternatives to the single occupant vehicle through the use of Transportation Demand Management (TDM) techniques.
- Develops a process to determine the impacts of local development decisions on the regional transportation network, facilitating integration of decisions about land development, transportation investment and air quality.
- Develops a computer travel model and database to be used for estimating future transportation needs and impacts.
- Develops and updates a seven year capital improvement program to promote the goals of the CMP.

The 2007 Marin County Congestion Management Program (CMP) was designed to address the existing and future transportation congestion in Marin County and its cities and towns. Roads in the
Transportation Vision for Marin County

In addition to the CMP, in 2003, TAM produced *Moving Forward, A 25-Year Transportation Vision for Marin County*, the purpose of which “is to act as a blueprint that will guide development of a detailed implementation or expenditure plan that establishes priorities against a framework of financial opportunities and constraints”. *Moving Forward* provides a framework for an integrated multi-modal transportation system that would reduce congestion by increasing transportation choices for all people in Marin County. Among the benefits highlighted for Tiburon include congestion relief at the Tiburon Boulevard / U.S. 101 interchange, expanded ferry service to San Francisco, and late night subsidized taxi service. 19

Paradise Drive Visioning Plan

The *Paradise Drive Visioning Plan*, prepared by the Marin County Community Development Agency, was accepted by the Marin County Board of Supervisors in February 1999. The *Visioning Plan* presents goals and actions for transportation planning along Paradise Drive in the unincorporated area. In Section III, Traffic, of the plan describes Paradise Drive:

Paradise Drive is a narrow, winding, two-lane road which is traveled by a variety of users. The primary source of traffic is from the residents living in the area, from providers of various services, and from Romberg Tiburon Center staff, students, and participants in meetings at the Center. Bicyclists, dog walkers, rollerbladers, and joggers use the road for recreational purposes; some motorists use it as a means to bypass traffic going over Alto Hill on Highway 101. Safety is a primary concern, especially with the diverse users on the road. While widening the road might be a means to solve many of the problems, doing so would require extensive grading, tree removal, and right-of-way acquisition and would ultimately alter the character of the area.

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19 *Moving Forward, a 25-Year Transportation Vision for Marin County*, Marin County Congestion Management Agency, Marin County Board of Supervisors, and Marin County Transit District, February 2003.
Paradise Drive from the Corte Madera Town limit to the end of the Tiburon Peninsula varies in width from 18 to 24 feet. This width allows two traffic lanes but no shoulders. There are occasional unpaved turnouts which can be used at times for parking. For much of the length of the road, there is a drainage ditch and a steep upward slope on the ridge side of the road and a steep drop-off on the bay side.

There are no active proposals to further improve Paradise Drive, mainly due to the cost of construction of such improvements and the grading which would be required to accomplish them. Additional driveways are not permitted when other options, such as access to a side street or private road easement, are available. When it is necessary for a driveway to be located on Paradise Drive, sight distance criteria are applied to minimize potential hazards.

**Goal III-1:** To maintain the rural character and configuration of Paradise Drive and improve safety for all users.

**Actions:**

Investigate ways to provide safety improvements without making major changes to the road.

Identify locations where safety improvements could be made, such as more turnouts, small shoulder widening, and paving. Work with County Public Works Department staff to identify locations for constructing turnouts for bicyclists to allow passing by motor vehicles and in those locations to replace the double stripe at the road centerline with a single stripe line to allow additional passing room.

**Transportation Sales Tax Expenditure Plan**

In November 2004, Marin County voters approved Measure A, the Traffic Relief and Better Transportation Act. Measure A is expected to generate $331.6 million over 20 years, and the money will be used to implement the Transportation Vision through the Transportation Sales Tax Expenditure Plan developed by TAM, the Marin County Board of Supervisors, and the Marin County Transit District. The goals of the Expenditure Plan are to sustain and enhance local bus services, maintain and improve the existing road infrastructure, and directly address current and emerging local congestion problems. 20

**Water Transit Authority**

The Water Transit Authority (WTA) was formed in October 1999 and charged with creating a plan for new and expanded water transit services and related ground transportation terminal access services. It was further mandated that the WTA study ridership demand, cost-effectiveness and expanded water transit’s environmental impact. In the Final Implementation & Operations Plan, approved in July 2003, the WTA recommends new ferry service to several new cities, including Richmond, Berkeley, and Redwood City, and to enhance the service already provided to those cities which currently have service, including Tiburon. The WTA also has the authority to assume operation of ferry systems in order to enhance service and consolidate the many varied ferry service operators into one organization.

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20 Marin County Transportation Sales Tax Expenditure Plan, County of Marin, May 6, 2004.
Marin County recognizes in its *Countywide Plan (CWP)* that transportation systems and land use patterns are inextricably linked, and any major change to one triggers the need to modify the other. The *CWP* calls for both circulation improvements and new development to enhance the travel experience for pedestrians, cyclists, and transit users so that alternative modes are successful in reducing car traffic and accommodating demand. Marin County has a *Roadway Impact Fee Ordinance* which provides for the repair and maintenance of County streets and roads resulting from construction activity. Also, Sub-regional Transportation Improvement Fees are assessed for new developments to pay their fair share for transportation facilities fees in specific study areas.

Policy TR-1.4 requires that new development pay its fair share of the transportation system impacts, and Policy TR-1.5 requires necessary transportation improvements to be in place, or to otherwise guarantee their timely installation, before or concurrent with new developments.

Implementing Program TR-1.g Determine Appropriate Mitigation specifies “require the preparation of a traffic impact analysis report to identify impacts and mitigation measures for projects that may result in significant traffic impacts.” TR-1.g lists the fully funded and constructed southbound U.S. 101 off-ramp at Tiburon Boulevard / East Blithedale Avenue widening at the ramp terminus with East Blithedale Avenue. The *CWP* lists the following improvement which is not fully funded but listed as needing further evaluation before implementation:

- Improve Tiburon Boulevard overcrossing with additional lanes (particularly in the eastbound direction from southbound U.S. 101 to Strawberry Drive), more offramp and onramp capacity, accommodation of bicyclists and pedestrians, and better access to bus transit stops in the interchange.

Implementing Program TR-1.j Install Highway Improvements, states “work with the Transportation Authority of Marin and Caltrans to carry out physical and operational improvements, such as completion of the High Occupancy Vehicle lane and ramp metering projects on Highway 101.”

Implementing Program TR-1.s VMT Reduction Monitoring and Implementation and Transportation Demand Management Program specifies:

- All new residential projects consisting of 25 units or more should be located within ½-mile of a transit node, shuttle service, or bus route with regularly scheduled, daily service.

- Safe, convenient connections should be provided to existing pedestrian and bicycle facilities

Consistent with *CWP* policies TR-1.4 and TR-1.5, the Town of Tiburon’s Traffic Mitigation Fee (TMF) Program was reviewed to determine relevant planned projects that would respond to the Countywide policies and implementing programs, specifically, to “identify impacts and mitigation measures for projects that may result in significant traffic impacts,” then “require that new development pay its fair share of the transportation system impacts” and “guarantee their timely installation.”
Marin County Public Transportation Facilities Fee

Marin County has a Public Transportation Facilities Fee ordinance to mitigate cumulative impacts at selected intersections from future projects. The fee is based on the number of new PM peak-hour trips generated by a proposed project.

Town of Tiburon Traffic Mitigation Fee Program & Planned Improvements

The Town of Tiburon first established a Traffic Mitigation Fee (TMF) Program in 1980 that was later updated in 1995. Following an update to the Tiburon General Plan in 2005, it was necessary to update the fee program again, since the updated General Plan identifies new future development and circulation improvements that were not contained in the 1995 fee program. The TMF fee is based on the number of PM peak hour trips generated by each new project, and the fee varies between designated areas of Town (known as “traffic analysis zones”). The updated fee program was adopted by the Town Council in January 2007. The Tiburon General Plan calls for the following improvements that are incorporated into the TMF program:

• Add a second westbound lane on Tiburon Boulevard approaching the intersection with Trestle Glen Boulevard.

• Add a merge/acceleration lane for traffic turning left from Reed Ranch Road onto Tiburon Boulevard. (This proposed improvement has been completed.)

• Consider applying to Caltrans for installation of a traffic signal at Stewart Drive / Tiburon Boulevard to improve safety.

• Consider adding a merge / acceleration lane for traffic turning left from Gilmartin Drive onto Tiburon Boulevard, and / or a dedicated right turn only lane from southbound Gilmartin Drive to westbound Tiburon Boulevard.

• Signalize Mar West Street and Tiburon Boulevard intersection when signal warrants are met.

• Where Tiburon Boulevard intersects the Frontage Road immediately east of U.S. 101: Add a third northbound Frontage Road lane, resulting in one left turn lane, a combined left/through lane, and one right turn lane; or add a third westbound Tiburon Boulevard through lane; or add a third northbound Frontage Road lane and a third westbound Tiburon Boulevard through lane.

• Add a merge/acceleration lane for traffic turning left from Cecilia Way onto Tiburon Boulevard.

The Tiburon General Plan Circulation Element includes other measures which focus on safety improvements to be considered in conjunction with traffic studies for specific development proposals. Policies applicable to the Easton Point traffic study pertain to Paradise Drive:

• C-20: Turnouts and widened shoulders on Paradise Drive should be created where possible to protect the health and safety of its users.

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21 Marin County Code, Marin County Board of Supervisors, Chapter 15.07.
22 Circulation Element, Town of Tiburon General Plan, op. cit., page 5-10.
Implementing programs are:

- C-d: The Town shall work with the County of Marin and LAFCO to formulate a long-term plan for maintaining and improving Paradise Drive.

**Marin County Code Title 24 Development Standards**

The 2008 Easton Point Residential Development project would be required to be consistent with the Marin County Code. Title 24 (Development Standards) of the County Code establishes standards of improvements and construction for the development of land within the unincorporated area of Marin County. Relevant development standards are discussed below.

**OBSERVED OPERATIONAL AND SAFETY CONCERNS**

As a part of the preparation of this EIR the Crane Transportation Group (the EIR traffic analyst) conducted observations of existing conditions at several intersections. The EIR traffic analyst’s observations are provided below.

**Tiburon Boulevard / Redwood Highway Frontage Road** This signalized intersection is observed to have lengthy back-ups on the north, east, and west approaches to the intersection.

Because of the close spacing of off-ramp intersections, the four-lane capacity of the U.S. 101 overcrossing, insufficient turn lanes for some intersection approaches, and overall traffic volume, peak hour traffic results in congestion and back-ups on Tiburon Boulevard through the interchange from the U.S. 101 Southbound Off-Ramp intersection east to the Redwood Highway Frontage Road intersection. The *Tiburon General Plan’s* planned road improvements (cited above and included in the TMF program) would address these operational issues. In addition, the overall Tiburon Boulevard interchange design requires all eastbound or westbound traffic approaching the interchange which is destined to the north or south on the freeway to use the curb travel lanes. Eastbound traffic destined for the Redwood Highway Frontage Road also must use the curb travel lane. Thus, many periods occur when there are extended eastbound and westbound vehicle queues in the curb travel lanes on both approaches to the interchange while the median travel lanes have much shorter back-ups. The CWP implementing program’s measure (cited above) to “improve the Tiburon Boulevard overcrossing with additional lanes” would support the purpose of the Tiburon General Plan’s TMF program measure to “add a third westbound Tiburon Boulevard through lane; or add a third northbound Frontage Road lane and a third westbound Tiburon Boulevard through lane.”

**Trestle Glen Boulevard / Tiburon Boulevard** This signalized intersection, currently operating at LOS B during the AM and PM peak hours, is observed to have lengthy back-ups on both Tiburon Boulevard intersection approaches. The *Tiburon General Plan’s* planned road improvement cited above (add a westbound through lane on Tiburon Boulevard ) would address the back-up issue, and support CWP’s policy TR-1.2 requiring maintenance of service standards, TR-1.5 requiring necessary transportation improvements, and implementing programs requiring identification of “impacts and mitigation measures for projects that may result in significant traffic impacts,” “require that new development pay its fair share of the transportation system impacts” and “guarantee their timely installation.”

**Reed Ranch Road / Tiburon Boulevard** This Tiburon Boulevard unsignalized intersection currently operating at poor levels of service during the weekday AM and PM commute traffic peak hours (Reed Ranch Road) has stop sign-controlled turning movements (left-turns from Reed Ranch Road)
From 2008 Easton Point Residential Development Draft EIR

operating at an unacceptable level of service per Marin County’s standard of LOS D. Left turns at this intersection currently operate at LOS F during the weekday AM and PM peak commute traffic peak hours. However, mitigation only can occur when and if signal warrants are met at this intersection. The volume of traffic turning from Reed Ranch Road to Tiburon Boulevard is too low to meet the peak hour volume warrant, thus, Tiburon Boulevard remains uncontrolled by a signal and has turning movements operating acceptably. This is the optimal condition for the intersection, until, or unless, signal warrants are met. Throughout this EIR, the peak hour volume warrant is checked to determine whether signalization would be warranted to mitigate the poor level of service at this intersection, consistent with the CWP’s policy TR-1.2 requiring maintenance of service standards, TR-1.5 requiring necessary transportation improvements and implementing programs requiring identification of “impacts and mitigation measures for projects that may result in significant traffic impacts,” “require that new development pay its fair share of the transportation system impacts” and “guarantee their timely installation.” Since mitigation would require signalization, and signal warrants are not met, minor additions of traffic to this intersection are not considered to create an impact that is significant.

Observed conditions at other EIR study locations are described below.

**Paradise Drive** Paradise Drive, from Main Street in downtown Tiburon to the project site’s MMWD water tank service road, has winding narrow eight- to ten-foot lanes and shoulders varying from zero to two feet wide. For most of its length, shoulders are less than one-foot wide. This allows little room for driver inattention through the curves and little to no room to pull over to the shoulder for refuge, if an on-coming vehicle is cutting corners through the curves and crossing the centerline.

The remote scenic qualities of Paradise Drive (in some locations it provides the only public road access to views of San Francisco Bay along the northern and eastern parts of the Peninsula) make it attractive for scenic and recreational drivers, runners, and bicyclists. However, throughout its length there are no pathways, consistent width shoulders, or sufficiently wide paved travel lanes to accommodate both vehicles and bicyclists or pedestrians. Along most sections of Paradise Drive, there is no refuge for pedestrians and bicyclists to move out of the way of oncoming vehicles. Through the narrowest road segments (eight-foot lanes with no shoulders), if a car encounters a bicyclist pedaling ahead, the driver must slow to the speed of the bicycle until both arrive at a road section sufficiently wide and with adequate sight distance to allow the car to pass the bicycle safely. Observations indicate that drivers sometimes do not wait for a sufficiently safe viewing distance to pass but enter the lane of opposing traffic on the chance that there will be no collision. The segment of Paradise Drive near the site currently has a very low level of peak hour traffic, and, while lane widths are considered adequate for prevailing traffic volumes, it is the opinion of the EIR traffic analysts that the road width is unsafe for use by bicyclists and pedestrians. This is recognized by the fact that the Bay Trail, a pedestrian and bicycle trail, is not officially designated anywhere along Paradise Drive because the road and right-of-way generally are too narrow to widen, straighten, or paint a bicycle lane. The existing Class II (signed and striped) bicycle route ends in the vicinity of Mar West Street (east).

Marin County Public Works researched the five-year collision rate for the approximately three-mile long segment of Paradise Drive (from milepost 4.31 to 7.22) and found it to be “below the state-wide average for conventional two-lane roads in both rolling and mountainous terrains.”

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known data indicating that bicycle or pedestrian collision rates are higher than average on Paradise Drive.

Paradise Drive / MMWD Water Tank Service Road Access from Paradise Drive to the project site is provided at the gated, paved service road that extends from Paradise Drive to the MMWD Paradise Water Tank. A driveway to a residence at 2800 Paradise Drive is located directly opposite the MMWD driveway. This intersection has inadequate sight distance for vehicles turning onto Paradise Drive. This has been addressed by installing a 36-inch mirror directly across from the outbound MMWD driveway, and a 24-inch mirror directly across from the outbound driveway serving 2800 Paradise Drive.

Old Tiburon and Hill Haven Neighborhood Streets Public scoping comments by residents of the Old Tiburon and Hill Haven neighborhoods describe the problems created by narrow roads on hilly terrain, citing Diviso Street (16.5 feet to 19.5 feet wide) as a bottle-neck and the acute-angle Diviso Street / Centro West Street / Centro East Street intersection as posing difficulties for movement of large vehicles. Field observations confirm that a large truck attempting to make a right-turn from southbound Diviso Street onto westbound Centro West Street requires a three-point turn. This maneuver temporarily obstructs the passage of other vehicles through the intersection. Field observation of large truck turns through the Solano Street / Centro West Street intersection revealed that such trucks turning left from northbound Solano Street onto westbound Centro West Street cut the corner through the turn, swinging into the eastbound (opposing direction) traffic lane. These are existing traffic hazards, raising safety concerns for residents. During the time of field work for this, and the 2001 Draft EIR, there were many instances of on-going maintenance or minor construction activity at Old Tiburon and Hill Haven residences. For example, along a very narrow segment of Centro West Street a haul truck and dumpster (about ten feet by ten feet in size) were observed parked on-street, reducing the road to one narrow lane. This slowed the progress of through traffic. On Ridge Road a haul truck was observed to block opposite direction traffic. Pedestrians using the narrow, winding road sections with no sidewalks were observed to walk with caution, moving to the best available refuge from the travel lanes when approaching vehicles are seen or heard. During peak traffic periods this can result in stressful walking and a sometimes hazardous walking environment.
Transportation Significance Criteria

The transportation analysis uses criteria from the State CEQA Guidelines, the Marin County Environmental Impact Review guidelines, and public scoping comments. Based on the State CEQA Guidelines, the project would have a significant transportation impact if it would:

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

- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

- Result in inadequate emergency access.

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant transportation impact if it would:

- Significantly affect intersection LOS, resulting in an unacceptable service level (e.g. below LOS D).

- Not have adequate parking and internal circulation capacity to accommodate project traffic so that offsite areas are not adversely affected.

- Not include provisions for pedestrian and bicycle circulation and bicycle and motorcycle parking and security.

Based on County supplemental requirements and common engineering practice, the project would have a significant traffic impact if:

- Additional traffic generated by the project would cause an unsignalized intersection to warrant signalization.

Based on public scoping comments, the project would have a significant traffic impact if:
• Additional traffic generated by the project would substantially increase the risk of a traffic accident on the existing residential street network that provides access to the project site.

**REGIONAL ROADS**

The project would have a significant regional road impact if the project would result in exceedance of the LOS standards established by the Transportation Authority of Marin (TAM) on designated CMP facilities. TAM established LOS standards for U.S. 101 (LOS E or better is acceptable) and Tiburon Boulevard (LOS D or better is acceptable). Based on these criteria a significant impact would occur if:

• LOS on U.S. 101 would deteriorate from LOS E to F as a result of project traffic.

• LOS on Tiburon Boulevard would deteriorate from LOS D to E during the weekday PM peak hour as a result of project traffic.
PROJECT TRAFFIC GENERATION

During the public scoping process for the 2008 Easton Point Residential Development EIR several comments were made that standard trip generation rates prepared by the Institute of Transportation Engineers were not representative of residential projects in the Tiburon area. In response to these comments and in order to determine trip generation rates to be used for the 2008 Easton Point Residential Development EIR analysis, five days of 24-hour counts were conducted at two Tiburon neighborhoods with characteristics similar to those proposed for the Easton Point residential units:

- large lots (over one-half acre) with landscaped areas, and
- homes of 6,000 square feet or more in size.

The neighborhoods located on the upper reaches of Reed Ranch Road and the upper reaches of Gilmartin Drive were determined to be the most representative of these characteristics. Count data was determined for the AM and PM peak hours, then averaged for the five count days for each neighborhood. Finally, data for the two locations was averaged, resulting in the following trip generation rate (see Exhibit 5.1-12).

Exhibit 5.1-12
Trip Generation Rate Results from Two Tiburon Neighborhoods

<table>
<thead>
<tr>
<th>Location</th>
<th>AM Peak Hour</th>
<th></th>
<th>PM Peak Hour</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In</td>
<td>Out</td>
<td>Total</td>
<td>In</td>
</tr>
<tr>
<td>Upper Gilmartin Drive</td>
<td>0.73</td>
<td>0.50</td>
<td>1.22</td>
<td>0.42</td>
</tr>
<tr>
<td>Upper Reed Ranch Rd.</td>
<td>0.42</td>
<td>0.58</td>
<td>1.00</td>
<td>0.50</td>
</tr>
<tr>
<td>Average of Both</td>
<td>0.58</td>
<td>0.54</td>
<td>1.12</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group. 2009

It was found that the normal pattern of inbound / outbound trips (normally higher outbound in the morning and higher inbound in the evening) does not hold true for either neighborhood. This is due to the number workers traveling to these homes in the morning and leaving in the afternoon and evening. The neighborhoods are a “work destination” for a large number of workers. This is in contrast to standard rates in common use per the Institute of Transportation Engineers, 8th edition (see Exhibit 5.1-13).
Exhibit 5.1-13
Trip Generation Rate per ITE 8th Edition (Peak Hour of Adjacent Street Traffic)

<table>
<thead>
<tr>
<th>Land Use</th>
<th>ITE Land Use Code</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>In</td>
<td>Out</td>
</tr>
<tr>
<td>Single-Family Residential</td>
<td>210</td>
<td>0.19</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group. 2009

However, the total two-way trip rate (1.12 for the AM peak hour, and 1.16 for the PM peak hour, is not greatly different than the trip rate documented for Tiburon in its Traffic Fee Program update (see Exhibit 5.1-14).

Exhibit 5.1-14
PM Peak Hour Trip Generation Rate per Tiburon Traffic Mitigation Fee Program Update, November 2006

<table>
<thead>
<tr>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Single-Family Residential</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group. 2009

Application of the averaged trip rate from the two Tiburon neighborhoods to buildout of the 43 single-family detached houses would generate the trips shown in Exhibit 5.1-15: 26 inbound and 24 outbound trips would be expected during the AM peak hour, and 19 inbound and 30 outbound trips would be expected during the PM peak hour.

Exhibit 5.1-15
Project Trip Generation a b

<table>
<thead>
<tr>
<th>Road</th>
<th># of Units</th>
<th>AM Peak Hour Trips</th>
<th>PM Peak Hour Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>In</td>
<td>Rate</td>
</tr>
<tr>
<td>Mountain View</td>
<td>3</td>
<td>0.58</td>
<td>2</td>
</tr>
<tr>
<td>Ridge Road</td>
<td>27</td>
<td>0.58</td>
<td>16</td>
</tr>
<tr>
<td>Lots 21-23</td>
<td>3</td>
<td>0.58</td>
<td>2</td>
</tr>
<tr>
<td>Forest Glen Court</td>
<td>10</td>
<td>0.58</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>26</td>
<td>24</td>
</tr>
</tbody>
</table>

a  Trip Rate Sources: Surveys conducted in two Tiburon neighborhoods – upper reaches of Reed Ranch Road and upper reaches of Gilmartin Drive (after #120) by Crane Transportation Group for the Easton Point EIR Transportation Analysis, May, 2009.

b  The traffic volume from each project development area has been rounded up or down to the nearest 1.0.

Source: Crane Transportation Group, 2009
PROJECT TRIP DISTRIBUTION

Based on existing traffic patterns to and from residential areas during the weekday AM and PM peak hours on Paradise Drive and Tiburon Boulevard, and based on the location of major employment and shopping areas, it is expected that almost all peak hour project traffic would travel to / from the west (south) of the site via Paradise Drive and Tiburon Boulevard. There are two routes to downtown Tiburon to and from the Old Tiburon neighborhood site vicinity:

- Via Ridge Road, Centro East Street, Solano Street, Paradise Drive-Tiburon Boulevard.
- Via Ridge Road, Centro West Street, Beach Road-Esperanza Street, Tiburon Boulevard.

To present a conservative analysis, all project traffic traveling through the Old Tiburon neighborhood was assumed to travel to / from the west (south) via the Ridge Road, Centro East Street, Solano Street, Paradise Drive-Tiburon Boulevard route. However, it is just as likely that project-generated traffic could divide evenly along the two routes to Tiburon Boulevard.

Exhibits 5.1-16 through 5.1-19 show the project increment of traffic on the road system for both the AM and PM peak hours.

Exhibit 5.1-20 shows project additions to the AM and PM peak hour total approach volumes on Tiburon Boulevard-Paradise Drive at three intersections:

- In the project site vicinity just south of (proposed) Forest Glen Court.
- In the downtown just east of Beach Road.
- At the west end of town, just east of the Redwood Highway Frontage Road near U.S. 101.
Source: Crane Transportation Group, 2009
Exhibit 5.1-17
AM Peak Hour Project Increment Eastern Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-18
PM Peak Hour Project Increment Western Tiburon

Source: Crane Transportation Group, 2009

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Exhibit 5.1-19
PM Peak Hour Project Increment Eastern Tiburon

Source: Crane Transportation Group, 2009
### Exhibit 5.1-20

**Project Traffic Added to Existing Volumes At Select Intersections**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Existing Intersection Total Approach Volumes</th>
<th>Existing + Project Intersection Total Approach Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM Peak Hour</td>
<td>PM Peak Hour</td>
</tr>
<tr>
<td></td>
<td>Volume</td>
<td>% Increase</td>
</tr>
<tr>
<td>Paradise Drive / Forest Glen Court</td>
<td>21</td>
<td>45</td>
</tr>
<tr>
<td>Beach / Tiburon / Paradise</td>
<td>890</td>
<td>1,140</td>
</tr>
<tr>
<td>Redwood Highway Frontage / Tiburon / East Blithedale</td>
<td>3,780</td>
<td>4,380</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

At the Paradise Drive / Forest Glen Court intersection, project traffic would increase the existing total approach traffic volume by about 52 percent during the AM peak hour and by about 25 percent during the PM peak hour. At the Beach Road / Tiburon Boulevard intersection, project traffic would increase the existing total approach traffic volume by about 5.4 percent during the AM peak hour and by about 4.2 percent during the PM peak hour. At the Redwood Highway Frontage Road / Tiburon Boulevard intersection, project traffic would increase the existing total approach traffic volume by about one percent during the AM peak hour and PM peak hours.

### PROJECT FEATURES

**Proposed Roads and Driveways**

Site access would be provided by three roads, each ending in a cul-de-sac. In addition, site access would be provided by five driveways and a temporary construction access road. According to the definitions contained in the Marin County Code (MCC), Title 24 Development Standards, Section 24.04.016 Definitions, *road* is used interchangeably with *street* and means the actual physical surface or way over which vehicles pass. This does not include curbs, gutters, sidewalks or unpaved shoulders. *Private road* means a road over which the general public has no right to pass and the easement for which is not subject to a current offer of dedication to a public agency. *Cul-de-sac* means a road open at only one end; a dead-end road. The end of the road design (e.g., cul-de-sac *turnaround* design) is determined by the amount of traffic the road is planned to accommodate. *Turnaround* means an enlarged or otherwise enhanced area of a road, driveway or parking area designed to allow vehicles to reverse direction safely and with relative ease.

A *driveway* is defined as the vehicular way providing access to a property from a road, normally terminating at a designated on-site parking area.

Roads are defined in the MCC to be either:

- a *minor residential road*, defined as a road providing access to a generally residential area and which serves or may serve seven to 19 dwelling units, and a maximum potential average daily traffic (ADT) of 500 (MCC Section 24.04.016), or
• a *limited residential road*, defined as a road which serves two to six dwelling units, and a maximum potential ADT of 150 (MCC Section 24.04.016).

The three proposed roads are:

• Forest Glen Court (would provide direct access to seven housing units).
• Ridge Road (would provide direct access to 13 housing units).
• Mt. Tiburon Court (would provide direct access to ten housing units).

Based on the number of houses served, all three roads would be considered minor residential roads.

The five proposed driveways are:

• Lots 1 to 3 Driveway (as an extension of Mountain View Drive)
• Lots 5 to 6 Driveway
• Lots 7 to 9 Driveway
• Lots 21 to 23 Driveway
• Lots 29 to 31 Driveway

The three on-site roads are proposed to be private and maintained by the property owners’ association. Even though they would be private roads they would still be required to meet Marin County (and Tiburon Fire Protection District) road design standards.

Ridge Road, Mt. Tiburon Court, and Forest Glen Court are proposed to have travel lanes as narrow as the Tiburon Fire Protection District recommended minimum standards allow (ten-foot wide lanes with no shoulders); this would be narrower than Marin County recommended standards for minor residential roads (28 feet wide) which would allow for two ten-foot wide lanes with four-foot wide shoulders on each side, or the Marin County recommended standards for limited residential roads (20 feet wide with shoulders), which would allow for two ten-foot wide lanes with an unspecified shoulder width. MCC Section 24.04.110(c) specifies that *shoulders shall be provided on each side of all roads*. *Shoulders shall normally be four feet wide although wider shoulders may be required as deemed appropriate by the agency*. Marin County standards are discussed in relation to emergency access and provision of safe on-site roads later in the impact section.

A temporary construction access road is proposed to extend between the Forest Glen Court cul-de-sac to the boundary of Lot 39 (near the Mt. Tiburon Court cul-de-sac).

**Site Access Improvements**

Site access would be provided by extensions of some existing streets and construction of new roads, as follows:

• Mountain View Drive, an existing 24-foot wide road, would be extended from the cul-de-sac within the Hill Haven neighborhood as a 16-foot wide driveway to serve Lots 1 to 3.
• Ridge Road, an existing 24-foot wide road, would be extended for a distance of about 1,400 feet as a 20-foot wide paved road within a 40-foot wide road and utility easement and would terminate in a cul-de-sac (the road would be 24-foot wide at the entry to the cul-de-sac). It would serve Lots 4 and 5, and Lots 10 through 20 directly and also would serve the Lots 7 to 9 driveway (a 400 foot long shared driveway). The driveway would initially be 16-feet wide, narrowing to 12-feet wide after (northwest of) Lot 7. Lot 6 would be served by a driveway off of Ridge Road.

• Ridge Road connects to other Hill Haven streets: Lagoon View Drive, Vistazo (East and West, which in turn connect to Diviso Street, Centro (East and West) streets and Solano Street.

• Mt. Tiburon Court would be a new 20-foot wide paved road connecting to Ridge Road. It would serve proposed Lot 24 and Lots 35 through 43.

Paradise Drive would have intersections with one proposed driveway and one proposed road, as follows:

• A new 16-foot wide paved driveway off of Paradise Drive would provide access to Lots 21 to 23. It would narrow to 12-feet wide after (north of) Lot 21.

• Forest Glen Court would intersect Paradise Drive at the present location of the existing MMWD water tank service road and would generally follow the alignment of (but would replace) the 25-foot wide service road for a distance of about 800 feet. The new 20-foot wide paved road within a 40-foot wide road and utility easement would serve Lots 25 through 28 and 32 through 34. The Lots 29 to 31 driveway would be 16 feet wide, narrowing to 12 feet wide to serve Lots 29 and 30. Forest Glen Court would terminate in a cul-de-sac (the road would be 24-feet wide at the entry to the cul-de-sac).

In addition to the above roads and driveways a temporary construction access road would be constructed on-site as follows:

• A construction access road would extend from the terminus of Forest Glen Court to the terminus of Mt. Tiburon Court. The construction access road would be ten feet wide with turnouts and paved, grooved (textured) concrete. After construction, this road is proposed to remain in use for emergency egress and would be blocked at both ends by a barricade gate.

Roads (including driveways) would have grades of up to 18 percent (See Exhibit 3.0-7). The construction access road, however, would have a maximum grade of 25 percent.

**Off-Site Improvements**

As a part of the project the applicant proposes to provide off-site traffic improvements including the following:

• Post signs prohibiting parking along both sides of Diviso Street and along other residential streets narrower than 20 feet wide.

• Provide stop or yield sign control for the side streets intersecting Ridge Road.

The applicant’s traffic engineer recommends additional improvements, as follows:
• Improve the Forest Glen Court / Paradise Drive intersection to provide a minimum of 150 feet of sight distance in both directions for outbound vehicles.

• Widen Paradise Drive road to include four-foot shoulders with 60-foot tapers at the Lots 21 to 23 Driveway and the proposed Forest Glen Court intersection.

**Pedestrian Facilities**

A public pedestrian access easement is proposed along a portion of Ridge Road, up to Mt. Tiburon Court, and along Mt. Tiburon Court to provide access from the Hill Haven neighborhood to the existing adjacent public open space (Old St. Hilary’s Open Space Preserve and Tiburon Uplands Preserve). The proposed access easement would also provide access to Parcel A.

Project plans show no easement connection to Old St. Hilary’s Open Space Preserve, although this connection is intended by the applicant. Although not shown on the Precise Development Plan, according to the applicant the intent of the public access easement is to follow Ridge Road as far as Mt. Tiburon Court, then to follow Mt. Tiburon Court until it adjoins Marin County Open Space. From there, the public could access Old St. Hilary’s Open Space Preserve, Tiburon Uplands Preserve, and all of Parcel A. 24

Public pedestrian facilities would be limited to the access easement along a portion of Ridge Road / Mt. Tiburon Court. However, the adjacent neighborhoods would have direct pedestrian access to the proposed Parcel A open space from both Straits View Drive and Spanish Trail.

Within the project site, no sidewalks or pathways would be provided, thus, pedestrians would share the roads and driveways with motor vehicles and bicyclists. The temporary construction access road would be blocked to vehicle traffic (other than emergency vehicle use), thus, it might be used as a pedestrian pathway, although it would lack linkages to other pedestrian paths or sidewalks, and sections of the road would exceed the MCC maximum of 18 percent for sidewalk grades (MCC Section 24.04.490).

**Bicycle Facilities**

The project site plans show no bicycle accommodations. The applicant’s traffic engineer has recommended a four-foot shoulder along a portion of the project frontage that could accommodate southbound bicyclists on Paradise Drive at Forest Glen Court and at the Lots 21 through 23 driveway. 25 The applicant’s traffic engineer also recommended that any improvements along the Paradise Drive frontage should include consideration of the needs of bicyclists.

**EIR ASSUMPTIONS**

Since the proposed project is in unincorporated Marin County the controlling planning documents and ordinances are Marin County documents. However, in conducting the traffic analyses there is the need


to consider some of the transportation proposals in the *Tiburon General Plan* and also the Town’s traffic mitigation fee program. For purposes of this analysis, the EIR traffic analysts have included both Marin County and Town of Tiburon planned improvements and funding status.

Since the *CWP* and the County’s most current traffic modeling projections do not address the most recent growth projections in the Tiburon Planning Area, cumulative traffic volumes are based on the current Town of Tiburon’s PM peak hour traffic model, which forecasts the growth in traffic that would be generated by buildout of the *Tiburon General Plan* and the Tiburon Planning Area, updated to 2009 conditions.

**NO OR LESS-THAN-SIGNIFICANT IMPACTS**

Based on the findings of the analyses completed as a part of this Draft EIR it has been determined that the proposed *2008 Easton Point Residential Development* would have either no or less-than-significant impacts for the following significance criteria.

- 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.

No aspect of the proposed project would affect air traffic patterns. No impact would occur.

**IMPACT ANALYSIS**

**Impact 5.1-1 Existing-Plus-Project Impacts on Study Intersections**

Project traffic would increase traffic volumes at study intersections along Tiburon Boulevard and Paradise Drive. This would be a less-than-significant impact.

**EXISTING-PLUS-PROJECT CONDITIONS**

Project-generated trips were added to existing weekday AM and PM peak hour volumes to obtain existing-plus-project volumes. The resulting existing-plus-project traffic volumes are shown in Exhibits 5.1-21 through 5.1-24.

Exhibits 5.1-25 and 5.1-26 present the existing-plus-project levels of service at all study intersections. Project traffic added to existing volumes on Tiburon Boulevard would result in the following:

- At signalized intersections currently operating acceptably, the addition of project traffic would not result in an unacceptable level of service operation.

- At the one unsignalized intersection with side street left turns currently operating unacceptably in both the AM and PM peak hour (Reed Ranch Road / Tiburon Boulevard), the addition of project traffic volumes would not result in meeting the signal warrant #3 criteria levels. Exhibit 5.1-27 shows the results of signal warrant evaluation.

**Mitigation Measure 5.1-1** No mitigation would be required.
Exhibit 5.1-22
Existing + Project AM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-23
Existing + Project PM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-24
Existing + Project PM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2009
### Exhibit 5.1-25
**Intersection Level of Service -- AM Peak Hour**

<table>
<thead>
<tr>
<th>Intersection Control</th>
<th>Intersection</th>
<th>Existing Without Project</th>
<th>With Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal</td>
<td>1. Southbound Highway 101 Off-Ramp / East Blithedale</td>
<td>C- 20.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C- 20.7&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Signal</td>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard</td>
<td>C- 22.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C- 22.6&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Signal</td>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>C-22.3</td>
<td>C-22.6</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>4. Reed Ranch Road / Tiburon Boulevard</td>
<td>F*-*/B-12.2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F*-*/B-12.3&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Signal</td>
<td>5. Trestle Glen / Tiburon Boulevard</td>
<td>B-14.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Signal</td>
<td>6. Avenida Miraflores / Tiburon</td>
<td>B-18.3</td>
<td>B-19.2</td>
</tr>
<tr>
<td>Signal</td>
<td>7. Rock Hill / Tiburon Boulevard</td>
<td>B-12.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B – 12.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>8. Trestle Glen / Paradise Drive</td>
<td>B-11.4/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>B-11.5/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Signal</td>
<td>9. San Rafael Avenue / Tiburon</td>
<td>B-10.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-10.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Signal</td>
<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>B-15.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.2&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>11. Mar West Street (West) / Tiburon Boulevard</td>
<td>C-22.9/C-17.6&lt;sup&gt;d&lt;/sup&gt;</td>
<td>C-24.5/C-18.7&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Signal</td>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>B-15.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.8&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>13. Vistazo Road / Ridge Road / St Bernard</td>
<td>A-9.9/A-8.9/A-7.3&lt;sup&gt;e&lt;/sup&gt;</td>
<td>B-10.4/A-9.0/A-7.3&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>14. Mar East Street / Tiburon Boulevard</td>
<td>B-10.4&lt;sup&gt;f&lt;/sup&gt;</td>
<td>B-10.9&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>15. Forest Glen Court / Paradise Drive</td>
<td>NA/NA&lt;sup&gt;g&lt;/sup&gt;</td>
<td>A-8.5/A-7.2&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**F**<sup>*</sup> = Average delay exceeds 3 minutes. **Bold type** indicates unacceptable level of service.

- **a** Signalized level of service-average vehicle delay (in seconds).
- **b** Signalized level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Southbound Reed Ranch Road right-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.
- **c** Signalized level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement / Northbound Trestle Glen left turn to Paradise Drive.
- **d** Signalized level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.
- **e** Signalized level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/Southbound Ridge Road approach.
- **f** Signalized level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.
- **g** Signalized level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.

Source: Crane Transportation Group, 2009
### Exhibit 5.1-26
**Intersection Level of Service – PM Peak Hour**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing Without Project</th>
<th>Existing With Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Southbound Highway 101 Off-Ramp / East Blithedale</td>
<td>Signal</td>
<td>C- 21.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C- 21.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>C- 33.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C- 34.2&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>4. Reed Ranch Road / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>F-96.5/B-12.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F-104.7/B-12.2&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>5. Trestle Glen / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-14.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.8&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>6. Avenida Miraflores / Tiburon</td>
<td>Signal</td>
<td>B-14.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.6&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>7. Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>A-8.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>A- 8.6&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>8. Trestle Glen / Paradise Drive</td>
<td>Stop Sign</td>
<td>B-11.8/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>B-11.8/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>9. San Rafael Avenue / Tiburon</td>
<td>Signal</td>
<td>A-9.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>A-9.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-13.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-13.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>11. Mar West Street (West) / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>C-24.9/ D-28.8&lt;sup&gt;d&lt;/sup&gt;</td>
<td>D-26.6/ D-31.7&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-18.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-18.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>14. Mar East Street / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>A-7.3&lt;sup&gt;e&lt;/sup&gt;</td>
<td>A-7.3&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>15. Forest Glen Court / Paradise Drive</td>
<td>Stop Sign</td>
<td>NA/NA&lt;sup&gt;g&lt;/sup&gt;</td>
<td>A-8.9/NA&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**F** = Average delay exceeds 3 minutes. **Bold type** indicates unacceptable level of service.

- **a** Signalized level of service-average vehicle delay (in seconds).
- **b** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Southbound Reed Ranch Road right-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.
- **c** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.
- **d** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.
- **e** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/ Westbound Vistazo Road approach/Southbound Ridge Road approach.
- **f** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.
- **g** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.

Source: Crane Transportation Group, 2009.
**Exhibit 5.1-27**

**Signal Warrants**

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing Without Project</th>
<th>Existing With Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reed Ranch Road/Tiburon Boulevard</td>
<td>AM  No</td>
<td>PM  No</td>
</tr>
<tr>
<td>Mar West Street / Tiburon Boulevard</td>
<td>AM  No</td>
<td>PM  No</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

**Impact 5.1-2  Cumulative Buildout-Plus-Project Impacts to Study Intersections**

Cumulative-plus-project conditions would increase peak hour traffic volumes at all study intersections. With planned improvements, all but three study intersections would operate acceptably, with or without the project, during the AM and PM peak hours: The signalized Avenida Miraflores / Tiburon Boulevard intersection would operate unacceptably at LOS E during the weekday AM peak hour, the signalized Rock Hill Drive / Tiburon Boulevard intersection would operate unacceptably at LOS E during the weekday PM peak hour, and the unsignalized Reed Ranch Road southbound left turn to Tiburon Boulevard would operate unacceptably at LOS F during the AM and PM peak hours. No improvements are planned for these intersections. The addition of project traffic would increase the average delay at the Avenida Miraflores and Rock Hill Drive intersections, and this delay would be cumulatively considerable.

At the Reed Ranch Road / Tiburon Boulevard intersection, where signal warrants would not be met even with General Plan buildout plus project traffic volumes, southbound left turns from Reed Ranch Road would continue to operate at an unacceptable LOS F, however, the flow of traffic on Tiburon Boulevard would remain at an acceptable LOS C. Project traffic would contribute only to through traffic on Tiburon Boulevard, which, with project traffic added, would have acceptable LOS C operation. Per Marin County and Transportation Authority of Marin significance standards, the project’s impact at this intersection would not be cumulatively considerable.

**CUMULATIVE CONDITIONS**

In order to evaluate potential impacts resulting from future development in Tiburon, an analysis of cumulative traffic conditions was conducted. The most current traffic modeling projections in the Tiburon Planning Area are contained in the Town of Tiburon’s traffic model, thus, cumulative traffic volumes are based on the Town of Tiburon’s PM peak hour traffic model (2009 update). Since the traffic model does not include traffic growth forecasts for the AM peak hour, cumulative traffic during those peak hours was derived by determining the percent increase in PM peak hour traffic at each intersection, and applying the same rate of growth to AM peak hour traffic. The resulting cumulative traffic volumes (without project trips) are shown on Exhibits 5.1-28 through 5.1-31.

Exhibits 5.1-32 through 5.1-35 show cumulative traffic volumes including project-generated trips.
Exhibit 5.1-28
2020 Cumulative Base Case (Without Project) AM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-29
2020 Cumulative Base Case (Without Project) AM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-30
2020 Cumulative Base Case (Without Project) PM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-31
2020 Cumulative Base Case (Without Project) PM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-32
2020 Cumulative Base Case + Project AM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-33
2020 Cumulative Base Case + Project AM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-34
2020 Cumulative Base Case + Project PM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2009
Exhibit 5.1-35
2020 Cumulative Base Case + Project PM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2009
Exhibits 5.1-36 and 5.1-37 show intersection LOS at study intersections under cumulative conditions, with and without the project. LOS is shown for the existing lane configuration and control, and for the planned configuration called for in the Tiburon General Plan, and supported by policies in the CWP.

Exhibits 5.1-36 and 5.1-37 show that with cumulative conditions, with planned improvements, all but three study intersections would operate acceptably, with or without the project, during the AM and PM peak hours: The signalized Avenida Miraflores / Tiburon Boulevard intersection would operate unacceptably at LOS E during the weekday AM peak hour, the signalized Rock Hill Drive / Tiburon Boulevard intersection would operate unacceptably at LOS E during the weekday PM peak hour, and the unsignalized Reed Ranch Road southbound left turn to Tiburon Boulevard would operate unacceptably at LOS F during the AM and PM peak hours. No improvements are planned for these intersections. In the AM peak hour the addition of project traffic would increase the average delay at the Avenida Miraflores intersection from 64.8 seconds to 70.2 seconds, for a change of 5.4 seconds. In the PM peak hour the addition of project traffic would increase the average delay at the Rock Hill Drive intersection from 60.5 seconds to 64.8 seconds, for a change of 4.3 seconds. Because the additional total intersection delay would be caused by the proposed project, the project’s contribution to the cumulative impact would be cumulatively considerable.

In both the AM and PM peak hour at the Reed Ranch Road / Tiburon Boulevard intersection, where southbound left turns from Reed Ranch Road would continue to operate at an unacceptable LOS F, the flow of traffic on Tiburon Boulevard would remain at an acceptable LOS C with the addition of project traffic. Based on both Marin County and Transportation Authority of Marin significance standards, this impact would not be cumulatively considerable – project traffic would not result in Tiburon Boulevard operating below LOS D (the Transportation Authority of Marin standard for Tiburon Boulevard); and project traffic would not result in the signal warrant being met at this intersection (Marin County supplemental standard asks whether the project would cause a signal warrant to be met at an unsignalized intersection). Project traffic would not add volumes to the existing unacceptable turning movement (southbound left turns from Reed Ranch Road); the project’s traffic contribution would be restricted to the acceptable (LOS C) flow of through traffic on Tiburon Boulevard, and would not add to the volume of southbound left turns from Reed Ranch Road which are operating at LOS F under existing and cumulative conditions.

Exhibit 5.1-38 presents the signal warrant #3 evaluation for unsignalized intersections, and shows that with cumulative volumes signal warrant criteria would be met at the Mar West / Tiburon Boulevard intersection during the PM peak hour. Warrant #3 criteria would not be met at the Reed Ranch Road / Tiburon Boulevard intersection, and signalization would not be considered until volume warrants are met.

Mitigation Measure 5.1-2 Mitigation of cumulative traffic impacts to study intersections would require payment of a prorated share of planned improvements and payment in full for mitigation of the unplanned improvements.

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26 Planned improvements per Town of Tiburon General Plan: Redwood Highway Frontage Road/ Tiburon Boulevard (planned lane improvements); Trestle Glen / Tiburon Boulevard (planned lane improvements); Mar West Street (West) / Tiburon Boulevard (planned signal control).
Mitigation Measure 5.1-2(a) The applicant shall pay the project’s prorated share of planned lane improvements at the Redwood Highway Frontage Road / Tiburon Boulevard intersection and Trestle Glen / Tiburon Boulevard intersection, consistent with traffic mitigation fees to be determined by the Town of Tiburon and supported by the CWP. Additionally, the applicant shall pay the project’s prorated share of planned signalization of the Mar West / Tiburon Boulevard intersection, consistent with traffic mitigation fees to be determined by the Town of Tiburon and supported by the CWP. The resulting acceptable LOS is shown in Exhibits 5.1-36 and 5.1-37 for these three intersections.

Mitigation Measure 5.1-2(b) The applicant shall pay the project’s fair share for provision of overlapping phasing for the southbound left turn from both Avenida Miraflores and Rock Hill Drive to Tiburon Boulevard. The fair share calculation shall be done by the Town of Tiburon. Resulting mitigated intersection LOS for these two intersections is shown in Exhibits 5.1-39 and 5.1-40.

Significance After Mitigation Implementation of Mitigation Measures 5.1-2(a) and 5.1-2(b) would reduce cumulative impacts to less-than-significant levels. These improvements are feasible, pending approval by Marin County, Caltrans and the Town of Tiburon. With these measures, project impacts would not be cumulatively considerable significant impacts at these intersections.

Responsibility and Monitoring The applicant would be responsible for payment of prorated shares of planned improvements and funding the unplanned signal phasing changes. The County of Marin, in consultation with the Town of Tiburon and Caltrans, would be responsible for implementing the Mitigation Measures listed as 5.1-2.

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Policy basis for mitigation measures: Marin County’s, Sub-regional Transportation Improvement Fees are assessed for new developments to pay their fair share for transportation facilities fees in specific study areas.

The CWP Policy TR-1.4 requires that new development pay its fair share of the transportation system impacts, and Policy TR-1.5 requires necessary transportation improvements to be in place, or to otherwise guarantee their timely installation, before or concurrent with new developments.

Implementing Program TR-1.g Determine Appropriate Mitigation specifies “require the preparation of a traffic impact analysis report to identify impacts and mitigation measures for projects that may result in significant traffic impacts.”

Implementing Program TR-1.j Install Highway Improvements, states “work with the Transportation Authority of Marin and Caltrans to carry out physical and operational improvements…”

Consistent with CWP policies TR-1.4 and TR-1.5, the Town of Tiburon’s Traffic Mitigation Fee (TMF) Program was reviewed to determine relevant planned projects that would respond to the Countywide policies and implementing programs, specifically, to “identify impacts and mitigation measures for projects that may result in significant traffic impacts,” then “require that new development pay its fair share of the transportation system impacts” and “guarantee their timely installation.”

Marin County has a Public Transportation Facilities Fee ordinance to mitigate cumulative impacts at selected intersections from future projects. The fee is based on the number of new PM peak-hour trips generated by a proposed project.
## Exhibit 5.1-36

**Intersection Level of Service -- AM Peak Hour**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing</th>
<th>Cumulative (2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Without Project</td>
<td>With Project</td>
</tr>
<tr>
<td>1. Southbound Highway 101 Off-Ramp / East Blithedale</td>
<td>Signal</td>
<td>C-20.6 ( ^a )</td>
<td>C-20.7 ( ^a )</td>
</tr>
<tr>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>C-22.5 ( ^a )</td>
<td>C-22.6 ( ^a )</td>
</tr>
<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
<td>C-22.3</td>
<td>C-22.6</td>
</tr>
<tr>
<td>4. Reed Ranch Road / Tiburon Boulevard (existing stop sign control)</td>
<td>Stop Sign</td>
<td>F-*/B-12.2 ( ^b )</td>
<td>F-*/B-12.3 ( ^b )</td>
</tr>
<tr>
<td>5. Trestle Glen / Tiburon Boulevard (existing configuration)</td>
<td>Signal</td>
<td>B-14.9 ( ^a )</td>
<td>B-15.5 ( ^a )</td>
</tr>
<tr>
<td>Trestle Glen / Tiburon Boulevard (planned configuration)</td>
<td>Planned Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Avenida Miraflores / Tiburon</td>
<td>Signal</td>
<td>B-18.3</td>
<td>B-19.2</td>
</tr>
<tr>
<td>7. Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-12.0 ( ^a )</td>
<td>B-12.1 ( ^a )</td>
</tr>
<tr>
<td>8. Trestle Glen / Paradise Drive</td>
<td>Stop Sign</td>
<td>B-11.4/ A-7.6 ( ^c )</td>
<td>B-11.5/A-7.6 ( ^c )</td>
</tr>
<tr>
<td>9. San Rafael Avenue / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-10.7 ( ^a )</td>
<td>B-10.9 ( ^a )</td>
</tr>
<tr>
<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.1 ( ^a )</td>
<td>B-15.2 ( ^a )</td>
</tr>
<tr>
<td>11. Mar West Street (West) / Tiburon Boulevard (existing stop sign control)</td>
<td>Stop Sign</td>
<td>C-22.9/ C-17.6 ( ^d )</td>
<td>C-24.5/ C-18.7 ( ^d )</td>
</tr>
<tr>
<td>Mar West Street (West) / Tiburon Boulevard (planned signal control)</td>
<td>Planned Signal</td>
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<td></td>
</tr>
<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.6 ( ^a )</td>
<td>B-15.8 ( ^a )</td>
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</table>
### 5.1 Transportation

**2008 Easton Point Residential Development Draft EIR**

<table>
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<tr>
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<td>14. Mar East Street / Tiburon Boulevard</td>
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<td>B-10.9 f</td>
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<tr>
<td>15. Forest Glen Court / Paradise Drive</td>
<td>Stop Sign</td>
<td>NA/NA g</td>
<td>A-8.5/A-7.2 g</td>
<td>A-8.6/A-7.3</td>
<td></td>
</tr>
</tbody>
</table>

**F** = Average delay exceeds 3 minutes. **Bold type** indicates unacceptable level of service. **Italics indicate planned improvements per Tiburon General Plan 2020.**

- **a** Signaled level of service-average vehicle delay (in seconds).
- **b** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Southbound Reed Ranch Road right-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.
- **c** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.
- **d** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.
- **e** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/ Westbound Vistazo Road approach/Southbound Ridge Road approach.
- **f** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.
- **g** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.

Source: Crane Transportation Group, 2009
### Exhibit 5.1-37
Intersection Level of Service -- PM Peak Hour

<table>
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<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing</th>
<th>Cumulative (2020)</th>
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<tr>
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<td>Without Project</td>
<td>With Project</td>
</tr>
<tr>
<td>1. Southbound Highway 101 Off-Ramp / East Blithedale</td>
<td>Signal</td>
<td>C- 21.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C- 21.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard (existing configuration)</td>
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<td>Redwood Highway Frontage Road / Tiburon Boulevard (planned configuration)</td>
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<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
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<tr>
<td>4. Reed Ranch Road / Tiburon Boulevard (existing stop sign control)</td>
<td>Stop Sign</td>
<td>F-96.5/B-12.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F-104.7/B-12.2&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>5. Trestle Glen / Tiburon Boulevard</td>
<td>Signal</td>
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<td>B-15.8&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
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<tr>
<td>6. Avenida Miraflores / Tiburon</td>
<td>Signal</td>
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<td>7. Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
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<td>A- 8.6&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>8. Trestle Glen / Paradise Drive</td>
<td>Stop Sign</td>
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<tr>
<td>11. Mar West Street (West) / Tiburon Boulevard (existing stop sign control)</td>
<td>Stop Sign</td>
<td>C-24.9/ D-28.8&lt;sup&gt;d&lt;/sup&gt;</td>
<td>D-26.6/ D-31.7&lt;sup&gt;d&lt;/sup&gt;</td>
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### Existing Cumulative (2020)

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<th>Intersection Control</th>
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<th>With Project</th>
<th>Without Project</th>
<th>With Project</th>
</tr>
</thead>
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<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
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<td>B-18.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-21.2</td>
<td>C-22.0</td>
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<tr>
<td>13. Vistazo Road / Ridge Road / St Bernard</td>
<td>Stop Sign</td>
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<td>B-12.2</td>
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<td>15. Forest Glen Court / Paradise Drive</td>
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<td>NA/NA&lt;sup&gt;g&lt;/sup&gt;</td>
<td>A-8.9/NA&lt;sup&gt;g&lt;/sup&gt;</td>
<td>A-9.1/NA</td>
<td></td>
</tr>
</tbody>
</table>

**F**<sup>*</sup> = Average delay exceeds 3 minutes. **Bold type** indicates unacceptable level of service. **Italics indicate planned improvements per Tiburon General Plan 2020.**

- **a** Signalized level of service-average vehicle delay (in seconds).
- **b** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Southbound Reed Ranch Road right-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.
- **c** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.
- **d** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.
- **e** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach / Westbound Vistazo Road approach/Southbound Ridge Road approach.
- **f** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.
- **g** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.
- **h** Add an exclusive northbound right turn lane to provide one left, one left/through, and one right turn lane. Resultant mitigated signalized level of service-average vehicle delay (in seconds).
- **i** Add a westbound Tiburon Boulevard right turn lane. Resultant mitigated signalized level of service-average vehicle delay (in seconds).

Source: Crane Transportation Group, 2009
### Exhibit 5.1-38
**Signal Warrants**

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing Without Project</th>
<th>Existing With Project</th>
<th>Cumulative Without Project</th>
<th>Cumulative With Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM</td>
<td>PM</td>
<td>AM</td>
<td>PM</td>
</tr>
<tr>
<td>Reed Ranch Road / Tiburon Boulevard</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Mar West Street / Tiburon Boulevard</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

### Exhibit 5.1-39
**Mitigated Intersection Level of Service -- AM Peak Hour**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Avenida Miraflores / Tiburon Boulevard</td>
<td>Signal</td>
<td>N/A</td>
<td>N/A</td>
<td>D-43.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>D-50.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>N/A</td>
<td>N/A</td>
<td>C-24.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-24.7&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Provide overlap phasing for southbound right turn. Resultant mitigated signalized level of service-average vehicle delay (in seconds).

Source: Crane Transportation Group, 2009

### Exhibit 5.1-40
**Mitigated Intersection Level of Service -- PM Peak Hour**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Avenida Miraflores / Tiburon Boulevard</td>
<td>Signal</td>
<td>N/A</td>
<td>N/A</td>
<td>D-41.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>D-46.8&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>N/A</td>
<td>N/A</td>
<td>C-30.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-32.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Provide overlap phasing for southbound right turn. Resultant mitigated signalized level of service-average vehicle delay (in seconds).

Source: Crane Transportation Group, 2009
Impact 5.1-3 Safety Impact Due to Inadequate Distances Approaching the Unsignalized Intersections of Paradise Drive with Project Access Roads

Visibility for drivers approaching the intersection of Paradise Drive with the proposed driveway to Lots 21 through 23 and the proposed intersection of Forest Glen Court would be subject to the AASHTO standard for stopping sight distance. The Forest Glen Court intersection would, in the opinion of the EIR traffic analyst, result in a potentially unsafe condition. This would be a significant impact.

SIGHT DISTANCE

“Sight distance” refers to the minimum distance that a driver traveling at “critical speeds” (the speed below which 85 percent of the vehicles are traveling) must have to see a vehicle entering the road from a side street or driveway and to be able to stop without colliding with the vehicle. Exhibit 5.1-41 shows the minimum sight distance requirements according to vehicle speed and road grade, based on American Association of State Highway and Transportation Officials (AASHTO) design standards. 28

Paradise Drive in the vicinity of the project site has two 12-foot travel lanes and one-foot paved shoulders, with widened shoulders at intersections. The proposed project would connect to Paradise Drive at two locations: near the intersection of Mar East Street where a driveway would be constructed to serve Lots 21 through 23, and near the northeast end of the project site, at proposed Forest Glen Court which would serve ten residential lots and the MMWD water tank. Observed speeds through the segment of Paradise Drive fronting the project site range from 20 to 25 miles per hour. Per AASHTO design standards, a private road intersection on this segment of Paradise Drive should have a minimum stopping sight distance of 155 to 158 feet (range is in consideration of variable road gradient).

The driveway to Lots 21 through 23 would be located on the outside of a sharp curve along Paradise Drive. The sight distance for drivers exiting this driveway would be about 250 feet to the north (east) and more than 250 feet to the south (west). At observed speeds of 20 to 25 mph through this sharp curve, the stopping sight distance for a driver on Paradise Drive to see an outbound vehicle would be adequate.

The Paradise Drive / Forest Glen Court intersection (access to MMWD water tank and proposed Lots 25 through 34) would be located on the inside of a sharp curve. Paradise Drive traverses vertical and horizontal curves north of the intersection and a horizontal curve south of the intersection, and steep bluffs on the project site side of Paradise Drive contribute to the sight line deficiency. Field measurements conducted by the EIR traffic analyst indicate that the sight distance for outbound turns from Forest Glen Court would be about 85 feet to the north and about 75 feet to the south. At observed speeds of 20 to 25 mph through this curve, the stopping sight distance for outbound vehicles (to see and be seen) would be inadequate according to AASHTO standards. 29 As discussed above in the discussion of Project Features, based on the applicant’s traffic analyst recommendations 30 the proposed project includes the following:

29 Ibid.
30 Focused Traffic Study for the Martha Company Project, Ibid.
• Improve the Forest Glen Court / Paradise Drive intersection to provide a minimum of 150 feet of sight distance in both directions for outbound vehicles.

• Widen Paradise Drive to include four-foot shoulders with 60-foot tapers at the driveway for Lots 21 through 23 and the proposed Forest Glen Court intersection.

At the Forest Glen Court / Paradise Drive intersection a retaining wall along Paradise Drive, ranging in height from 0.5 feet to nine feet to the north would be required. To the south a wall ranging in height from one foot to seven feet would be required. Both walls would continue up Forest Glen Court. No retaining walls would be required at the driveway to Lots 21 through 23.

Improvements to the sight distance at Forest Glen Court and the driveway to Lots 21 through 23 would likely require that a portion of the embankment rising from Paradise Drive would need to be graded. Improvements within the County’s right-of-way would require an Encroachment Permit from the County Department of Public Works.

**Exhibit 5.1-41**
**Minimum Sight Distance Standards**

<table>
<thead>
<tr>
<th>Vehicle Speed (mph)</th>
<th>Stopping Sight Distance (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grade</td>
</tr>
<tr>
<td></td>
<td>0%</td>
</tr>
<tr>
<td>15</td>
<td>80</td>
</tr>
<tr>
<td>20</td>
<td>115</td>
</tr>
<tr>
<td>25</td>
<td>155</td>
</tr>
<tr>
<td>30</td>
<td>200</td>
</tr>
<tr>
<td>35</td>
<td>250</td>
</tr>
</tbody>
</table>

Source: AASHTO Geometric Design of Highways and Streets, 2004

**NEED FOR LEFT TURN LANE AT THE PARADISE DRIVE PROJECT ACCESS INTERSECTIONS**

An evaluation also was conducted of the two proposed project access intersections along Paradise Drive, Forest Glen Court and the driveway to Lots 21 through 23, using Caltrans Left Turn Lane Warrant Criteria. These criteria are contained in the publication *Guidelines for Reconstruction of Intersections*. 31. Warrant criteria have been compared to 2009 “with project” volume levels and percent left turns, as well as year 2020 “with project” volume levels and percent left turns.

Comparison of these volumes and percentages with the Caltrans left turn lane warrant criteria shows that 2009 “with project” as well as year 2020 “with project” conditions would not meet left turn lane

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warrant criteria. Minimum warrant criteria require at least five percent approaching volume left turns and total volumes higher than those projected at the subject driveways. 32

Sight distance was also checked to determine if a left-turn lane is needed at either intersection due to insufficient stopping sight distance between a vehicle stopping to make a left turn and a following vehicle. Based on vehicle speeds through these sections of Paradise Drive, observed to range from 20 to 25 miles per hour, a vehicle should have a minimum stopping sight distance of 155 to 158 feet (range is in consideration of variable road gradient). The available sight distance from a northbound vehicle on Paradise Drive to a vehicle stopped to make a left turn at Forest Glen Court and at the Driveway to Lots 21 through 23, would exceed this range.

No left turn lane would be required for volume or sight distance reasons.

**Mitigation Measure 5.1-3** In order to reduce the significant access driveway safety impacts for the Paradise Drive / Forest Glen Court intersection (providing access to Lots 25 through 34), the applicant shall prepare a right-of-way improvement plan. The improvement plan shall clearly show that adequate sight distance would be provided and shall include the following measures:

- Improve the Forest Glen Court / Paradise Drive intersection to provide a minimum of 158 feet of sight distance in both directions for outbound vehicles. This would slightly exceed the 150 feet of sight distance, as recommended by the applicant’s traffic engineer, and is used to comply with the stopping sight distance standard cited in Exhibit 5.1-41.

- Widen Paradise Drive to include four-foot shoulders with minimum 60-foot taper at the proposed Forest Glen Court intersection.

**Significance After Mitigation** Implementation of this mitigation measure would provide adequate stopping sight distance for motorists approaching Forest Glen Court, in compliance with the AASHTO recommended sight distance. Based on the prevailing speed of 25 miles per hour, a minimum stopping sight distance of 158 feet would be required in order to comply with the AASHTO standard.

Mitigation Measure 5.1-3 would allow motorists, bicyclists, and pedestrians exiting Forest Glen Court to view motorists approaching the project entrance at a distance of 158 feet. Implementation of Mitigation Measure 5.1-3 would reduce this impact to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for design and installation of this measure in accordance with Marin County standards. The applicant shall prepare a right-of-way improvement plan for review and approval by Marin County. Marin County would be responsible for construction permitting, inspecting, and completion verification.

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32 Ibid.
Impact 5.1-4 Impact on Regional Roads

The project would generate trips that would travel on two facilities that are designated as routes of regional significance as part of the County Congestion Management Program (CMP): Tiburon Boulevard and U.S. 101. U.S. 101 would experience a significant impact resulting from regional growth, including growth within Tiburon which includes the proposed project. This would be a significant cumulative impact.

TIBURON BOULEVARD

The project would generate AM and PM peak hour trips, as shown on Exhibits 5.1-16 through 5.1-19. Project-generated peak hour trips would include travel on Tiburon Boulevard, a regional road that is part of the Marin County Congestion Management Program (CMP) network. The Marin County CMP identifies the weekday PM peak hour as the period of analysis, and LOS D or better is acceptable for arterial segments such as Tiburon Boulevard. With the addition of project trips, Tiburon Boulevard would operate acceptably at all study intersections, under existing conditions, and under cumulative conditions following installation of the planned improvements and recommended mitigation measures. This is demonstrated by the LOS analysis at study intersections: acceptable LOS would be maintained for Tiburon Boulevard, following the addition of project trips. Therefore, impacts to the designated CMP facility, Tiburon Boulevard, would be less-than-significant.

U.S. 101

Project trips also would impact U.S. 101, for regional travel. U.S. 101 is under the control of the State of California and the Marin Transportation Authority (TAM) is the responsible regional transportation agency. The U.S. 101 corridor is shown in the CWP to be operating over-capacity (LOS F) during the PM peak hour in both the northbound and southbound directions. This segment of U.S. 101 (e.g., north and south of Tiburon Boulevard) is “grandfathered in” as operating at a lower LOS than the established standard, meaning, this facility is allowed to continue to operate at the lower LOS until such time as they are improved or the traffic load is diverted. In its decision to grandfather this facility, the TAM has recommended an improvement plan be developed to address congestion on U.S. 101 and for grandfathered segments of other roads. The Marin Countywide Plan Final EIR previously identified significant unavoidable impacts to several sections of U.S. 101 resulting from countywide development, including development within Tiburon (including development of the project site). Impact 4.2-2 Unacceptable LOS on U.S. 101 at Golden Gate Bridge, Impact 4.2-9 Unacceptable LOS on U.S.101 from I-580 to Sir Francis Drake Boulevard, Impact 4.2-10 Unacceptable LOS on U.S. 101 from Second Street to I-580, and Impact 4.2-13 Unacceptable LOS on U.S. 101 at the Sonoma / Marin County Line were all determined to be significant unavoidable cumulative impacts. The addition of trips generated by development of the project site would represent a relatively small proportion of overall growth on the U.S. 101 corridor. Project trips would constitute less than 0.01 percent of overall traffic (U.S. 101 carries approximately 15,000 vehicles


34 Marin Countywide Plan, Marin County, adopted November 2007, page 3-149.

35 Findings Pursuant to the California Environmental Quality Act Marin Countywide Plan, adopted by the Marin County Board of Supervisors, November 2007.
during the PM peak hour). Although the proposed project would add very little traffic to the U.S. 101 corridor it would add an increment of cumulative traffic to a facility operating at an unacceptable LOS. This would be a significant unavoidable cumulative impact.

Mitigation Measure 5.1-4 The Marin Countywide Plan Final EIR identifies mitigation measures to reduce impacts on U.S. 101, see Mitigation Measures 4.2-2, 4.2-9, 4.2-10, and 4.2-13. These measures include improved public transportation service countywide, and additional travel lanes on U.S. 101 to provide additional road capacity. Implementation of these measures is outside the sole jurisdiction of Marin County.

Significance After Mitigation The findings adopted for the Marin Countywide Plan state that the identified mitigation measures are the responsibility of another public agency. Furthermore, although the identified impacts to U.S. 101 can be mitigated they can not be mitigated to a less-than-significant level. Therefore, this would be a significant unavoidable cumulative impact.

Responsibility and Monitoring As stated in the Marin Countywide Plan Final EIR several other agencies, including Caltrans and TAM in corporation with Marin County would be responsible for the U.S. 101 improvements.

Impact 5.1-5 Project Impact on Transit

Project related traffic would not adversely impact transit operations. Increase in demand for transit generated by the proposed project would be met by existing services. This would be a less-than-significant impact.

The project would not generate significant demand for transit ridership, and the bus and ferry lines serving the Tiburon Peninsula have sufficient capacity to accommodate project-generated transit trips. Therefore, the project would not result in significant unmet demand for transit service. Furthermore, the project would not interfere with planned transit facilities or conflict with adopted transit plans.

Near the project site, project-related construction and residential traffic would travel on Paradise Drive, which has no transit service. Therefore, project-generated traffic would not be expected to significantly impact transit operations.

For these reasons, the project would result in a less-than-significant impact to transit services and facilities.

Mitigation Measure 5.1-5 No mitigation would be required.

36 Ibid.
Impact 5.1-6  Project Impact on Bicycle Facilities and Bicycle Safety Issues

Project site residents would contribute to the number of bicyclists using Paradise Drive, a narrow and winding road that lacks shoulders and can be challenging for inexperienced cyclists. The project also would add motor vehicle traffic, in both directions, to the road, which has limited areas for motorists to pass bicyclists given the narrow width and frequent curves. While not significant alone, this additional increment of motor vehicle and bicycle traffic would exacerbate already constrained conditions. This would be a significant cumulative impact.

Currently, there are no bikeways on Paradise Drive, although the road has been designated as a Class III bicycle facility by the Town of Tiburon and Marin County. The County’s 2008 Unincorporated Area Bicycle and Pedestrian Master Plan contains a bikeways map indicating that, where feasible, the paved shoulders along Paradise Drive should be widened to safely accommodate bicycles. Similarly, the Town of Tiburon’s Bicycle and Pedestrian Master Plan 2008 Update states that the shoulder along Paradise Drive should be periodically widened to provide a minimum width of four feet, particularly at the following types of locations:

- Turnouts: provided periodically to allow motorists to safely pass cyclists.
- Uphill side of the road: allows cyclists to move over as they slow down during climbs, enabling motorists to safely pass.
- Blind corners: Allows cyclists to move over and provides extra “shy zone” through turns with limited lane widths.

Paradise Drive is designated as a portion of the San Francisco Bay Trail that extends from San Jose to Napa along both sides of San Francisco Bay. It is used by significant volumes of bicyclists. The Paradise Drive Visioning Plan includes an action recommendation to “investigate ways to provide safety improvements without making major changes to the roadway”. Currently, no specific bicycle improvements are identified for the project site frontage of Paradise Drive.

Given the unique travel patterns on Paradise Drive (with weekend peak bicycle volumes exceeding peak motor vehicle volumes), and taking into account the narrow road that constrains passing in most locations, the addition of motor vehicle trips resulting from the project would result in impacts to bicyclists traveling on Paradise Drive. While the project’s contribution of motor vehicle trips (about 50 trips during the AM and PM peak hours) would not be significant when taken alone, EIR traffic studies prepared for other projects in the area have found the addition of project traffic to Paradise Drive to result in a cumulatively significant impact to bicyclists. In particular, three previous studies on Paradise Drive have identified “unsafe” conditions for bicyclists on Paradise Drive that would be exacerbated by even minor increases in vehicle traffic:

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38 Unincorporated Area Bicycle and Pedestrian Master Plan, Marin County, adopted March 25, 2008.

39 Town of Tiburon Bicycle and Pedestrian Master Plan 2008 Update, op. cit.

• The Sorokko Property Draft EIR\(^{41}\) found that Paradise Drive “is unsafe for use by bicyclists and pedestrians” due to the lack of “consistent width shoulders.” Those findings noted that consistent width shoulders would “enable bicyclists and pedestrians to use the roadway outside the travel way (i.e., out of harm’s way from faster-moving traffic).” The Sorokko Project Draft EIR determined that the project would contribute to safety problems for pedestrians and bicyclists on Paradise Drive. The conditions of approval by Marin County for the Sorokko project included a requirement that the project applicant provide a road section to include an 11-foot wide travel lane, a four-foot paved shoulder, and a two-foot wide dirt shoulder along the frontage of the Sorokko property.\(^{42}\)

• The Tiburon Glen Project Draft EIR\(^{43}\) also contained a similar finding, noting that although motor vehicle traffic resulting from that project would only “slightly increase the number of vehicles traveling along Paradise Drive,” that a cumulative impact would occur because “any increase in vehicles would contribute to unsafe conditions along Paradise Drive.”

• The recent Alta Robles Draft EIR\(^{44}\) cited the above conditions and reached similar conclusions regarding “unsafe” conditions for bicyclists on Paradise Drive that would be exacerbated by even minor increases in vehicle traffic.

As discussed in the project trip distribution analysis above (see Exhibits 5.1-16 through 5.1-19) the proposed project would contribute additional vehicle traffic on Paradise Drive in both directions.

This would be a significant cumulative impact and the proposed project would make a cumulatively considerable contribution to this cumulative impact.

To address this issue, the applicant’s traffic analyst\(^{45}\) recommends the following, as part of project improvements:

• Maintain the existing configuration of Paradise Drive between the two access points, and widen the road to include four-foot shoulders with 60-foot tapers at the driveway on the south end (access to Lots 21 through 23) and the proposed Forest Glen Court intersection at the north end.

• Install Class III bike route signs, Countywide Bicycle Route Guide Signs, and appropriate warning and advisory signs along the project frontage.

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\(^{42}\) The conditions of approval also state “the review of requests for exceptions to this requirement should consider the preservation of protected trees, avoiding extending culverts with substantial retaining walls, and avoiding the necessity of relocating utility poles”.

\(^{43}\) Tiburon Glen Revised Draft Environmental Impact Report, Nichols • Berman, May 2003, pages 5.1-17 and 5.1-18.

\(^{44}\) Alta Robles Development Project Draft EIR, Nichols • Berman, 2009, impact 5.1-7.

\(^{45}\) Focused Traffic Study for the Martha Company Project, op. cit.
• Pavement improvements and/or road re-striping as part of the project should include consideration of the needs of bicyclists and shoulders and/or turnouts should be provided where opportunities exist.

The above recommendations address improvements only along the project site frontage (west side of Paradise Drive), which would provide a paved shoulder and refuge area for southbound pedestrians and bicyclists, but would leave conditions as they are today (little to no refuge) for northbound pedestrians and bicyclists through this section.

The proposed Swahn residential project, located on Bluff Point, across Paradise Drive from the 2008 Easton Point Residential Project, proposes some improvements along its Paradise Drive frontage. It is proposed to widen Paradise Drive along the frontage of the Swahn property to the north of the proposed entry gate for the purposes of bicycle and pedestrian safety. A shoulder within the Paradise Drive right-of-way would be widened to provide five feet from the fog line to the edge of payment for approximately 750 feet along the frontage of the property.

Mitigation Measure 5.1-6 The applicant shall implement the following mitigation measures to reduce impacts on bicyclists on Paradise Drive:

Mitigation Measure 5.1-6(a) The applicant shall improve Paradise Drive along the frontage of the project site beginning at least 60 feet south of the proposed Lots 21 to 23 driveway, and extending at least 60 feet north of the proposed Forest Glen Court intersection. Selectively widen the shoulder pavement along the project frontage of Paradise Drive within the public right-of-way.

Mitigation Measure 5.1-6(b) Provide Class III bike route signs, Countywide Bicycle Route Guide Signs, and appropriate warning and advisory signs along the project frontage.

Mitigation Measure 5.1-6(c) Provide Class III bike route signs, Countywide Bicycle Route Guide Signs, and appropriate warning and advisory signs for northbound traffic, along the opposite side of Paradise Drive (east side of the project frontage of Paradise Drive). To improve conditions for northbound traffic, wherever possible, selectively widen the shoulder pavement along the east side of the project frontage of Paradise Drive within the public right-of-way. Improvements shall be coordinated with the improvements proposed along the frontage of the Swahn property.

Significance After Mitigation Implementation of Mitigation Measure 5.1-6 would reduce the project’s contribution to cumulative impacts to bicyclists to a less-than-significant level, since provision of additional shoulder width would allow bicyclists to travel outside of the motor vehicle travel way for the southbound segment of Paradise Drive along the project site frontage. Selective paved widening on the east side of the project frontage of Paradise Drive would improve conditions for northbound bicyclists. This mitigation would allow southbound motorists to safely pass bicyclists on this segment of Paradise Drive, thus enhancing motor vehicle circulation as well. Although shoulders of varying widths would remain along the east side of the project frontage of Paradise Drive, as well as on other segments of Paradise Drive, the mitigation would result in a net improvement to bicycle and motor vehicle circulation along the project frontage.

46 Initial Study Swahn Design Review and Second Unit Permit, Marin County Planning Division, January 2010.

47 The fog line is the white line painted on the right side of the road. It is used as a tool for drivers to keep on the road during times of poor visibility.
Responsibility and Monitoring  The applicant would be responsible for design and installation of this measure in accordance with Marin County standards. Marin County would be responsible for construction permitting, inspecting, and completion verification. Implementation of this mitigation shall be coordinated with implementation of Mitigation Measure 5.1-3.

Impact 5.1-7  Project Impact on Pedestrian Circulation

Project implementation would not result in disruptions to existing pedestrian facilities, or interfere with planned pedestrian facilities. Project residents would be expected to contribute slightly to the number of pedestrians using Paradise Drive and Hill Haven neighborhood streets. The project could improve existing conditions in the Lyford’s Cove / Old Tiburon and Hill Haven neighborhoods. Paradise Drive fronting the project site is a road considered unsafe for pedestrian use. The project would add traffic to this unsafe existing road condition. While not significant alone, this additional increment of motor vehicle and pedestrian traffic would exacerbate already constrained conditions. This would be a significant cumulative impact. Additionally, the project site provides no pedestrian accommodation (no sidewalks or pathways outside the travel lane) on its proposed roads, and there is no public access through the site other than an access easement to Old St. Hilary’s Open Space Preserve along 20-foot wide roads. These would be significant impacts.

Marin County Code sections relevant to this impact discussion including the following:

Sidewalks  – Marin County Code Section 24.04.440 establishes standards for pedestrian circulation as follows:

(b) Sidewalks shall be required on only one side of each road within residential areas where densities will be less than four units per acre.

(c) Pedestrian paths of an acceptable width may also be required through the center of long blocks; to provide access to schools, parks, playgrounds, open space, and other public areas; to river, lake, bay and ocean frontages; to connect cul-de-sac streets and where otherwise necessary as determined by the agency and/or the community development agency. If located outside of the right-of-way of a county-maintained road, provisions must be made for their maintenance.

(d) Sidewalks may be eliminated on one or both sides of streets where it is found that topography, density or other circumstances makes them impractical as determined by the agency.

Section 24.04.490 states:

Sidewalk grades shall not exceed 18 percent. Steps may be required in special instances.

Multipurpose Pathways – Marin County Code Section 24.04.510 states:

Multipurpose pathways (e.g., bicycle, equestrian, jogging) may be required when deemed appropriate by the agency and/or the community development agency or as specified within the Marin Countywide Plan or any other adopted plan. Such pathways shall be designed in accordance with the Caltrans standards and specifications contained in the current editions of “Planning and Design Criteria of Bikeways in California” except for such modifications as may be allowed or required by the agency to address a specific circumstance.

The CWP Trails Plan Map depicts a proposed Bay, Coastal or Ridge Trail along Paradise Drive at the project site boundary. The map also shows proposed trails within the project site that would provide
access to the adjacent open space west of the project site. As proposed the 2008 Easton Point Residential Development does not include trails consistent with the CWP Trails Plan. 48

Project traffic would increase the number of vehicles traveling along narrow, winding segments of Hill Haven neighborhood streets, and along the most narrow and winding segments of Paradise Drive. Any increase in vehicles is considered to contribute to the existing unsafe condition for pedestrians along segments of existing Hill Haven roads narrower than 20 feet, and along Paradise Drive in the project vicinity.

An existing social path is located on the project site that provides a link from the Hill Haven neighborhood to Old St. Hilary’s Open Space Preserve and the Tiburon Uplands Preserve. As proposed the project would replace the social path with a public pedestrian access easement along a portion of Ridge Road, up to Mt. Tiburon Court, and along Mt. Tiburon Court to provide access from the Hill Haven neighborhood to the existing adjacent public open space (Old St. Hilary’s and the Tiburon Uplands Preserve). The proposed access easement would also provide access to Parcel A. No parking is proposed on-site for users of the proposed open space (Parcel A) or the adjacent public open space. Typically, the Marin County Open Space District (MCOSD) does not provide parking at trailheads. MCOSD relies primarily on public rights-of-way to provide the parking capacity necessary to serve open space visitors arriving by automobile. 49

As proposed, dedicated public access would be limited to portions of Ridge Road and Mt. Tiburon Court. Although, the adjacent neighborhoods would have direct pedestrian access to the proposed Parcel A open space from both Straits View Drive and Spanish Trail, both of these locations would require improvements to serve as feasible points of public access.

Within the project site, no sidewalks or pathways would be provided. With maximum road widths of 20 feet, roads would not be adequate to allow pedestrians to circulate along with motor vehicles and bicyclists. The temporary construction access road might be useful to pedestrians, but grades for this road would exceed the 18 percent maximum grade per Marin County Code and may be difficult to traverse. As discussed above, the applicant proposes to provide off-site traffic improvements in the Old Tiburon and Hill Haven neighborhoods. This would include the posting of signs prohibiting parking along certain streets and the provision of stop or yield sign control for the side streets intersecting Ridge Road. The intent of these measures are to improve both pedestrian and vehicle safety. 50

Impacts to pedestrian circulation resulting from the project would be significant.

**Mitigation Measure 5.1-7** The following measures would be required to reduce pedestrian circulation impacts.


49 Crane Transportation Group communication with James Raives, MCOSD Planner, 2009.

50 Applicant proposed improvements on roads within the Town of Tiburon would require approval of the Town of Tiburon.
Mitigation Measure 5.1-7(a)

The applicant shall make the following off-site road improvements, consistent with MCC Section 24.04.510:

- Consistent with the project description, the applicant shall improve the Forest Glen Court / Paradise Drive intersection. Consistent with Mitigation Measure 5.1-3 improvements shall provide the maximum amount of widening and paved refuge area for pedestrians.

- The applicant shall design the Lots 21 to 23 driveway / Paradise Drive intersection to provide the maximum amount of widening and paved refuge area for pedestrians.

- The applicant shall provide paved shoulder widening along both sides of Paradise Drive along the project frontage of Paradise Drive within the public right of way, to address traffic added by the project to both sides of the road. Improvements shall be as described in Mitigation Measure 5.1-6(a), (b), and (c). These intersections and widened shoulders would provide additional refuge areas for pedestrians consistent with the safety improvements described in Marin County and Town of Tiburon planning documents for Paradise Drive.

Mitigation Measure 5.1-7(b)

The applicant shall implement project proposed measures along Hill Haven neighborhood streets to improve safety. These include:

- Post signs prohibiting parking along both sides of Diviso Street and along other residential streets narrower than 20 feet wide.

- Provide stop or yield sign control for the side streets intersecting Ridge Road.

- Prohibit placement of dumpsters along Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets if the dumpster would intrude into the travel lanes. This would effectively prohibit the placement of dumpsters along streets narrower than 28 feet wide.

Although these measures would not address pedestrian safety for all segments of the Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets, conditions in these neighborhoods would be improved due to the project. Implementation of Mitigation Measure 5.1-7(b) would address many sections of the narrow, winding roads that would be used by project traffic, and would be considered to reduce project impacts to a less-than-significant level; implementation of these measures would improve existing pedestrian safety by maximizing the width of the travel way on Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets.

Mitigation Measure 5.1-7(c)

The applicant shall make the following on-site road improvements, consistent with MCC sections 24.04.440(b) and (c) regarding sidewalks and 24.04.490 regarding sidewalk grades.

- The applicant shall provide sidewalks or all-weather surface pathways on one side of each road.

- The applicant shall provide a public pathway connecting the Mt. Tiburon Court sidewalk to Old St. Hilary’s Open Space Preserve.
• All-weather surface pathways shall be consistent with the CWP trail plan.

**Significance After Mitigation** Implementation of Mitigation Measure 5.1-7(a), (b), and (c) together with Mitigation Measures 5.1-3 and 5.1-6, would reduce the project’s impact to pedestrians to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for design and installation of these measures in accordance with Marin County and the Town of Tiburon standards. Marin County would be responsible for coordinating with the Town of Tiburon, for construction permitting, inspecting, and completion verification. Implementation of the mitigation measures along Paradise Drive shall be coordinated with implementation of Mitigation Measure 5.1-3 and 5.1-6.

Implementation of Mitigation Measure 5.1-7(b) would require approval of the Town of Tiburon. The applicant would be responsible to secure the necessary approvals from the Town of Tiburon.

**Impact 5.1-8 Project Impacts Related to Vehicular Site Access**

Access to the proposed residential development would be provided at four locations connecting to off-site roads: two locations would be extensions of existing roads in the Town of Tiburon, and two locations would intersect Paradise Drive in Marin County. The Marin County Code specifically addresses “new driveway transitions” and both the Marin County Code and Tiburon General Plan specifically address intersections with Paradise Drive. Impacts related to site access would be less-than-significant.

The site access analysis below pertains to the design of the proposed access roads. 51

The three on-site roads are proposed to be private and maintained by the property owners’ association. Even though they are private roads they would still be required to meet Marin County (and Tiburon Fire) requirements.

**Transitions** - The Marin County Code requires that new driveway vertical transitions start at least four feet back from the edge of the adjoining road (MCC Section 24.04.285).

The proposed new road (Forest Glen Court) would have a vertical (upward) transition beginning more than four feet from the edge of Paradise Drive, and the proposed new driveway to Lots 21 through 23 would have a vertical (upward) transition beginning four feet from the edge of Paradise Drive, making these new connections to Paradise Drive consistent with Marin County Code transition requirements.

**Common Driveways** - The Marin County Code encourages common driveways for residential uses to improve or maintain traffic safety (MCC Section 24.04.270). Similarly, the Paradise Drive Visioning Plan contains a recommended action to “Plan new development to minimize the number of roadways and driveways onto Paradise Drive for safety and to reduce the need for grading and paving”.

The Lots 21 to 23 driveway, and access to Lots 25 through 34 and the MMWD water tank, would be provided by one new road and one new driveway intersecting Paradise Drive. The road serving Lots 25 through 34 and the water tank (Forest Glen Court) would generally follow the alignment of the existing MMWD water tank service road.

51 *Impact 5.1-3 Safety Impact Due to Inadequate Distance Approaching the Unsignalized Intersection of Paradise Drive with the Project Access Roads* analyzes the sight distance on Paradise Drive at the project access roads.
Limiting access for 13 new residential units to two intersections along Paradise Drive by clustering units served by a common road would be consistent with the recommendation to minimize the number of roads and driveways intersecting Paradise Drive serving new development.

This impact would be less-than-significant.

**Mitigation Measure 5.1-8**  No mitigation would be required.

**Impact 5.1-9**  Project Impacts Related to Project Site Emergency Access

The project would create demand for emergency services and require provision of adequate internal circulation for vehicles, pedestrians, emergency vehicles and fire trucks. In four locations turnouts would be needed to meet TFPD standards, and the temporary construction access road, proposed to be closed after construction except to provide emergency vehicle egress, would not comply with the TFPD standard for grade. This would be a significant impact.

Marin County Code specifies that *the appropriate fire department or protection district shall be consulted for comment, advice and mitigation suggestions* regarding driveway widths and grades. This impact discussion addresses Tiburon Fire Protection District (TFPD) standards in the context of access for emergency services. Marin County standards are discussed in relation to issues other than emergency access in **Impact 5.1-11 Provision of Safe On-Site Roads**.

Site access would be provided by three roads ending in a cul-de-sac (Ridge Road, Mt. Tiburon Court, and Forest Glen Court) and five multi-lot driveways. Roads are proposed to have travel lanes as narrow as the minimum Tiburon Fire Protection District recommended standards allow (ten-foot wide lanes with no shoulders); this would be narrower than Marin County recommended standards for minor residential roads (28 feet wide) or limited residential roads (20 feet wide with four-foot wide shoulders).

Since grades, paved width and other road conditions are critical for heavy fire equipment, the design of the site roads would be subject to minimum standards established by the TFPD. These standards include road and driveway widths, road and driveway grades, as well as turning radii, and turnout and turnaround requirements. The TFPD requires internal circulation systems that allow easy access and include wide corners and turnarounds at the ends of roads to allow vehicles to quickly exit the site. Restrictions on slope gradients are intended to allow safe maneuvering in all weather conditions. TFPD standards meet or exceed applicable Marin County Code standards regarding road grades, driveway width, curve radii, and turnouts and turnarounds. However, unlike Marin County standards, the TFPD standards do not specify provision of shoulders for minor or limited residential roads. **Impact 5.1-11 Provision of Safe On-Site Roads**, provides an evaluation of proposed new roads per Marin County Code standards.

**Road and Driveway Grades**  - The maximum allowable grade for private roads and driveways is 18 percent. TFPD will allow grades up to 21 percent if the applicant can demonstrate to TFPD's satisfaction that there is no feasible way to reduce the driveway grade to 18 percent and TFPD determines that it can serve the project. When grades exceeding 18 percent are necessary, grades of a maximum of 21 percent are allowed for a maximum length of 200 feet within any 1,000-foot section of the driveway. Grades exceeding 18 percent must be paved with grooved, textured concrete to provide adequate traction. In addition, when the TFPD approves grades over 18 percent, a higher standard of building sprinklers is required as well as restrictions on building materials (i.e., no wood siding).
The three proposed roads and five multi-lot driveways would have maximum grades of 18 percent (see Exhibit 3.0-7). The project roads and driveways would, therefore, comply with TFPD road grade requirements.

The temporary construction access road would have a 25 percent maximum grade. Although the construction access road is not intended for everyday traffic and is not required for emergency access to the project site the TFPD is concerned that requiring construction vehicles delivering heavy construction materials to travel on road grades that exceed TFPD maximum standard of 18 to 21 percent would create a safety hazard. The TFPD staff has stated that the District’s response vehicles may not be able to utilize the construction access road in an emergency because the 25 percent slope/grade of the construction access road exceeded the District’s road grade limit of 18 to 21 percent. The TFPD is concerned that an accident resulting from use of the construction access road would increase the risk of an incident at a location that would be difficult for TFPD personnel and equipment to access.

The project sponsor submitted two letters with the application that address the feasibility of using the proposed temporary construction access road for construction vehicle access during site grading and preparation and building construction. Ghilotti Construction Company, a company with a long history of residential project construction in Marin County, stated that they reviewed the proposed temporary construction access road with a maximum 25 percent inclined grade, and that in their opinion the road would be adequate for the primary construction access for the project provided the following recommendations are followed:

- The actual staging for building the temporary 1,600 foot long construction access road may require staging points every 400 to 500 feet and may initially require the use of Ridge Road for access to the project site.
- Install and securely anchor some type of barrier (temporary K-Rail, Metal Beam Guard Rail, etc) on the outboard and downward edges of all road curves.
- As a precautionary measure, install an emergency stop/crash cushion array located in the center of the Forest Glen Court cul-de-sac.
- One-way radio control access to the construction access road shall be maintained during construction activity.

Redhorse Construction Inc, a construction company with extensive experience in residential construction in Marin County, also reviewed the proposed design of the temporary construction access road and the letter prepared by the Ghilotti Construction Company. Redhorse Construction concluded that the temporary construction access road design appeared to be suitable for use as access to the

52 Nichols • Berman communication with Ron Barney, Fire Marshal, Tiburon Fire Protection District, March 2010.

53 Ibid.

upper areas of the project site from Forest Glen Court for the purposes of individual lot development and residence construction. Redhorse Construction endorsed the four recommendations of Ghilotti Construction Company and further recommended:

- The erection of construction speed limit signs on the road.
- The formulation of written access protocols for construction access road use.
- Adoption of emergency vehicle access procedures as part of the overall site safety program

Letters written by the two construction companies conclude that the proposed temporary construction access road design would be feasible for construction vehicle access during site development and home construction. Implementation of Ghilotti Construction and Redhorse Construction companies’ recommendations would establish access protocols for construction access road use, meter activity to one construction vehicle at a time, limit equipment speeds on the road, provide additional safety barriers on the road turns, and an emergency stop/crash cushion. In addition the formulation and adoption of emergency vehicle access procedures would provide a planned response to an incident anywhere on the project site. Implementation of all the recommendations would not eliminate the possibility of an accident, but implementation would reduce the risk of a serious accident to a less-than-significant level.

The TFPD believes the applicant’s proposal to keep the temporary construction access road as a possible means of egress from the project site in an emergency would constitute a hazard for vehicles because the road is too steep to serve as a safe secondary means of emergency egress from the Easton Point development. In addition, the temporary construction access road was not designed or intended to safely handle traffic without protocols, metering and overall use supervision. Therefore allowing the use of the construction access road for egress in an emergency would constitute a significant safety risk and would be a significant impact.

Road and Driveway Width

The TFPD requires that residential road widths be at least 20 feet wide. Consistent with Marin County Code requirements, driveways serving 2 to 6 residences must be at least 16 feet wide while driveways serving one residence must be at least 12 feet wide.

The three proposed roads (Ridge Road, Mt. Tiburon Court, and Forest Glen Court) would be 20 feet wide. The five multi-lot driveways would be 16 feet wide through sections serving two to six lots.

Curve Radius - TFPD requires a minimum 50-foot curve radius on driveways. For curves with less than a 60-foot wide radius, the driveway must be at least 14 feet wide at the curve with 16 feet of clearance.

All roads and driveways have been designed to comply with TFPD driveway curve radius requirements.

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55 1. Driveway with direct access from Mountain View Drive (serving lots 1-3); 2. Driveway with access from the extension of Ridge Road (serving lots 5 and 6); 3. Driveway with access from the extension of Ridge Road (serving lots 7 - 9); 4. Driveway with access from Paradise Drive near the Mar East intersection (serving lots 21-23); and 5. Driveway with access from Forest Glen Court (serving lots 25 – 34).
**5.1 Transportation**

TFPD requires driveways longer than 150 feet require a turnaround at the end. Driveways longer than 300 feet are required to provide turnouts. Turnouts must have a minimum improved width of 20 feet and a length of 75 feet, or a width of 24 feet and a length of 60 feet. Turnouts must be posted with no parking signs. A turnout must be provided for each 300 foot section of driveway.

Hammerhead turnarounds would be provided in four locations near the terminus of driveways. 56 Turnouts would be provided on Lot 18 for the upper reach of Ridge Road and on Lot 28 for the upper reach of Forest Glen Court. However, to comply with TFPD standards, turnouts would also be needed at the following four locations:

- Lots 7 to 9 driveway, in the vicinity of the boundary between Lots 7 and 8.
- Mt. Tiburon Court in the vicinity of the boundary between Lots 36 and 37.
- Ridge Road in the vicinity of Lot 10.
- Lots 29 to 31 driveway.

For the reasons stated above (driveway widths, needed turnouts, excessive road grade for the construction access road), the project would result in a significant impact to emergency access.

**Mitigation Measure 5.1-9** Revise the PDP to provide turnouts per TFPD requirements for driveways. Post all turnouts with “no parking” signs. Close the temporary construction access road to all use after cessation of construction, unless specifically approved by the TFPD for emergency use.

**Significance After Mitigation** Implementation of Mitigation Measure 5.1-9 would reduce the project’s impact to emergency access to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for design and installation of these measures in accordance with Marin County and the TFPD standards. Marin County would be responsible for construction permitting, inspecting, and completion verification.

**Impact 5.1-10** Project Traffic Added to Lyford’s Cove / Old Tiburon and Hill Haven Neighborhood Streets - Accident Records, Emergency Access and Traffic Flow 57

Long-term project traffic (all post-construction traffic) added to Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets would not result in significant impacts to existing or future road capacity. However, emergency access vehicles and residents of these existing neighborhoods would be exposed to more frequent unpredictable traffic flow and intermittent safety hazards when traveling on the existing narrow, winding residential streets. This would be a significant impact.

The roads in the Lyford’s Cove / Old Tiburon and Hill Haven neighborhoods currently have low traffic volumes. Exhibits 5.1-42 and 5.1-43 provide projected traffic volume additions to

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56 Hammerhead turnarounds are provided on Lots 6, 9, 23 and 30.
57 Impact 5.1-13 Project Construction Traffic Impacts analyzes project-related construction traffic in Phases One and Two, and for subsequent construction activity.
Exhibit 5.1-42

Project Traffic Increment Added to Hill Haven Streets AM Peak Hour

Source: Crane Transportation Group, 2009

1 = Existing Volumes
1 = Cumulative Increment (Year 2020 Buildout)
6 = Project Increment

xx = Project Increment

Notes:
- Lots 1-3
- Lots 4-20, 24, 35-43
- Lots 21-23
- Lots 25-34

Legend:
- Project Site

Not To Scale
Exhibit 5.1-43
Project Traffic Increment Added to Hill Haven Streets PM Peak Hour

Source: Crane Transportation Group, 2009
neighborhood streets and projected existing plus project volumes at the Ridge Road / Vistazo Street intersection. The addition of 35 (two-way) AM and 34 (two-way) PM peak hour vehicle trips generated by the proposed project would not exceed the capacity of Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets and intersections. However, project-generated traffic raises safety issues rather than road or intersection capacity issues. Residents traveling on these existing narrow winding streets would be exposed to more frequent unpredictable traffic flow and intermittent safety hazards.

Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets are described in detail above (*Existing Roads*) as narrow and winding. The older streets (such as Vistazo (East and West), Diviso, and Centro (East and West)) are less than 24-feet wide. This width is not sufficient for two-way traffic if there is on-street parking. Newer streets are 24 feet wide, meeting the Town’s minimum standard for public residential roads. This width is sufficient for two-way traffic flow with no on-street parking, but only minimally adequate for two-way flow with parking permitted on one side only. However, if parking is permitted on both sides, when cars are parked opposite each other, the 24-foot width is not sufficient for two-way traffic flow. At such times the road only accommodates a single travel lane (alternating one-way flow). Traffic through the neighborhood is local (these are not through traffic routes), and the road deficiencies are well-known to residents who must cope with the narrow road widths on a daily basis. Excessive speed is less often cited as a concern, as compared with slow progress through obstructed roads. Residents responding to the Notice of Preparation for this EIR in February 2009 cited numerous ongoing problems with access through the existing neighborhoods. Letters state that existing streets are narrow, and can be obstructed (as described above). The Lyford’s Cove / Old Tiburon Homeowner’s Association requested “current traffic analysis and tests” and a “thorough analysis of the safety issues presented by the project.” They asked “how to bring the existing unsafe routes into compliance…[and] how the fire district proposes to solve the bottleneck issue in the event of an emergency.”

At least eight letters detail existing problems experienced by residents with homes served by Hill Haven neighborhood and Lyford’s Cove / Old Tiburon neighborhood roads. Identified problems include existing narrow roads obstructed by maintenance trucks and dumpsters. There are several requests for accident and safety analyses of these roads. One letter specifically requests an examination of the safety and traffic issues along a specific route: Beach Road – Centro West – Diviso Street – Vistazo Street – Ridge Road.

To respond to requests for safety evaluation of existing streets, the EIR traffic analysts requested existing accident data from the Tiburon Police Department, and analysis from the Tiburon Fire Protection District regarding existing conditions and response times, as well as an assessment of problems anticipated due to increased demand for services resulting from the project.

The Tiburon Police Department reported the following five-year accident statistics for Ridge Road, Vistazo East and Vistazo West streets, Diviso Street, Centro East and Centro West streets, Solano Street and Paradise Drive near the Solano Street intersection:

- **2004:** Paradise Drive: one injury accident due to crossing over the double yellow line;
- **2005:** Ridge Road: one non-injury accident due to unsafe backing;
  Diviso Street: one non-injury accident due to DUI;
  Centro West Street: one non-injury accident due to unsafe turn;
Centro East Street: one non-injury accident due to right of way;
Paradise Drive: one injury accident due to unsafe speed;
one non-injury accident due to unsafe driving;

2006:  
Vistazo East Street: one non-injury accident due to hit and run;
Solano Street: one non-injury accident due to hit and run;

2007:  
Vistazo West Street: one non-injury accident due to hit and run;
Centro West Street: one non-injury accident due to failure to maintain lane;
Solano Street: one non-injury accident due to unsafe speed;
one non-injury accident due to hit and run;

2008: none

2009: (January through August 5): Paradise Drive: one injury accident due to unsafe driving.

These data do not appear to indicate a pattern of accidents at a single location, nor an unusually high number of accidents for individual streets. However, these data appear to support the concern that narrow streets may contribute to the number of accidents that are reported, specifically, “failure to maintain lane,” and “accident due to right of way.” Additionally, the four hit and run accidents may be due to side swipes along narrow roads. It is also likely that some near-accidents occur, and these would not be on record; thus, reported accidents likely under-report the situation.

The EIR traffic analyst asked questions of the Tiburon Fire Protection District that were raised by residents of the Hill Haven and Lyford’s Cove / Old Tiburon neighborhoods. Questions are shown in italics, followed by TFPD responses:

> How does the fire department deal with these neighborhoods (i.e., Lyford’s Cove / Old Tiburon and Hill Haven) today? Are there hazards related to access that we should be aware of?

The Tiburon Fire Protection District deals with these neighborhoods the same way it deals with all of Tiburon. There are no special response policies for this area. Tiburon and Belvedere are complete with several existing streets that do not meet current minimum accepted standards for road width, slope of grade and turning radius. The Easton Point development has submitted a proposal that contains streets and access routes complying with current TFPD standards.

> Will the addition of 30 residential units in the Easton Point development, needing to be served via roads in the Hill Haven neighborhood (Ridge Road, Vistazo East, Diviso, Centro East, Solano), raise issues for the TFPD?

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In evaluating this question TFPD researched its responses to Ridge Road and Mountain View over the last six plus years. Calls for service to 44 homes on these two streets were studied and 64 responses to this area of which 48 were emergency responses, were identified. TFPD’s mean response time to the 48 calls was five minutes and 35 seconds from time of dispatch to arrival at scene, the median response time was five minutes and 16 seconds. The average number of responses over the time period was 7.22 emergency calls per year. Based on these numbers the only issue raised has been the cumulative impact on the traffic along Tiburon Boulevard. The ambulance and any additional fire engines responding to this area will have to use Tiburon Boulevard for access. TFPD staff noted an increase in travel times along this main route. A potential mitigation for this impact may be to equip the remaining signal lights along Tiburon Boulevard with a traffic preemption device compatible with the current system.

Ten of the total proposed 43 Easton Point residences would be served via an intersection with Paradise Drive at the location of the existing MMWD water tank service road providing access to the east portions of the site. Access would be provided via roadways or driveways with grades up to 18 percent. This is an acceptable gradient per TFPD standards, but would travel time raise any issues for emergency service to this area?

There has been an insufficient demand for service in the existing area around the water tank access road to be statistically valid. This will not, however, be the most remote area of the district. While TFPD is constantly trying to improve response time to all constituents this particular area does not raise any special issues.

Would TFPD standards or Marin County Fire Department standards be applicable for this subdivision? TFPD would, presumably, be the first to respond.

The TFPD standards would apply to this development.

The Hill Haven and Lyford’s Cove / Old Tiburon streets are not subject to use by through traffic or by any large number of drivers unaware of the challenges presented by narrow, winding roads. This is because the majority of users are residents who use the streets on a daily basis, or by workers at residences who use the streets routinely. Field observations indicate that residents and users of these roads know how to negotiate the narrow, winding roads. Drivers are observed to routinely alternate one-way access when needed through narrow road sections (where on-street parking, construction vehicles, or dumpsters obstruct two-way travel). Difficulties are observed when large delivery trucks have to navigate tight turns, such as the intersection of Centro West / Centro East / Diviso Street. For this reason, the applicant proposes, and this EIR analysis supports, that all construction traffic be routed via Paradise Drive and Forest Glen Court (with the exception of access to Lots 1, 2, and 3 which would require use of existing Hill Haven streets, Ridge Road (upper elevations), and Mountain View Drive). Construction access to portions of the site bordering existing neighborhoods would be limited to an on-site construction access road with controlled use.

As discussed above, the applicant proposes specific measures to increase vehicle safety through existing neighborhoods to reduce the impact from additional project-generated traffic using these streets.

Post-construction traffic added to local Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets would not result in significant impacts to existing or future road capacity. However, emergency access vehicles and residents of these existing neighborhoods would be exposed to more frequent unpredictable traffic flow and intermittent safety hazards when traveling the narrow, winding residential streets. This would be a significant impact.
Mitigation Measure 5.1-10 In addition to the measures proposed by the applicant, the following additional measure would be required:

- Prohibit parking of dumpsters along Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets if the dumpster would intrude into the travel way. This would effectively prohibit the parking of dumpsters along streets narrower than 28 feet wide.

There are no other clear solutions to the existing narrow, winding streets in the Lyford’s Cove / Old Tiburon or Hill Haven neighborhoods. Road widening would require residents to dedicate lot frontages (lawns and landscaped areas) to the public road right-of-way. It is anticipated that most, if not all, residents would object to such a project.

Significance After Mitigation Implementation of Mitigation Measure 5.1-10 would address many sections of the narrow, winding roads that would be used by project traffic, and would be considered to reduce project impacts to a less-than-significant level; implementation of these measures would improve existing road safety by maximizing the width of the travel way on Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets.

Responsibility and Monitoring The applicant would be responsible for the funding cost of Mitigation Measure 5.1-10 before receiving land alteration or grading permits, and the Town of Tiburon would have to agree to implement the prohibition of dumpsters along narrow roads. The applicant would be responsible to secure the necessary approvals from the Town of Tiburon

Impact 5.1-11 Provision of Safe On-Site Roads

The proposed design of on-site roads would not meet Marin County standards. The proposed design of on-site roads raises safety concerns related to road widths and shoulder space. This would be a significant impact.

The project’s proposed site access improvements and off-site improvements are discussed above.

Marin County Residential Road Dimensions

The Marin County Code Title 24 provides controlling standards for all aspects of the proposed project. The following are code sections relevant to planning for roads throughout the proposed project.

Roads – The Marin County Code states the following:

General (MCC Section 24.04.020)

All new roads shall be constructed to the standards set forth in this chapter except as otherwise provided herein. These individual standards notwithstanding, the design of a road shall take into account the combined effect of the individual elements (e.g., centerline radii, grade, cross-slope) in making up the total road. Care shall be taken to avoid combining individual design elements at the extreme limits of acceptability along the same section of road. Where this is necessary due to severe physical, right-of-way or other constraints, then design modifications and/or other mitigating measures may be required as determined appropriate by the agency. These measures may include but are not limited to additional width, longer radii, slope grading, vegetation removal, striping or other lane and/or road edge delineation, signs, signals and barriers. Under certain circumstances, reductions in these standards may be allowed in accordance with Section 24.15.010 of this title.
5.1 Transportation

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Road classifications (MCC Section 24.02.030)

The design criteria for a road shall be based on the classifications defined below.

“Limited residential road” means a road which serves two to six dwelling units, and a maximum potential ADT of one hundred fifty.

“Minor residential road” means a road providing access to a generally residential area and which serves or may serve seven to nineteen dwelling units, and a maximum potential ADT of five hundred.

Intersections (MCC Section 24.04.060)

(a) Roads shall intersect each other as near to a right angle as is practical...curb or pavement returns shall have a minimum radius of twenty-five feet.

(b) Care shall be taken to avoid sight restrictions caused by the combined vertical alignments of two or more intersections streets.

(c) Design of intersections shall comply with Chapter 13.18 Visibility Obstructions, of the Marin County Code which prohibits sight obstructions including landscaping over thirty inches in height within defined areas adjacent to intersections.

Driveways (MCC Section 24.04.260)

(a) The minimum improved width of a driveway serving a single dwelling unit is twelve feet.

(b) The minimum improved width of a driveway serving two to six dwelling units is sixteen feet. Subject to the review and approval of the agency, this may be reduced to a minimum of twelve feet along all or part of its length if extenuating circumstances exist. In evaluating a proposal for such a reduction, the amount of grading and tree removal and the height of any retaining walls necessary to obtain the full width shall be of paramount consideration.

When such a reduction is proposed the design shall be submitted to the appropriate fire department or protection district for review, comment, advice and mitigation suggestions. In addition, one or more turnouts may be required as determined appropriate by the agency.

(c) A driveway which serves or may be extended in the future to serve more than six dwelling units shall be considered equivalent to a private road and designed accordingly. If the initial use of such a road will be by less than six units, then construction of the road may be done in phases as determined by the agency.

Road Width (MCC Section 24.04.110)

(a) Minimum widths for the improved section measured from face of curb to face of curb. Where no curb or berm is proposed the paved width shall be one foot greater then than listed to allow for edge striping and pavement edge raveling.

Limited residential road: 20 feet with shoulders.

Minor residential road: 28 feet.
(b) Additional width may be required for left turn storage, intersection widening, bus lanes and multipurpose pathways.

(c) Shoulders shall be provided on each side of all roads. Shoulders shall normally be four feet wide although wider shoulders may be required as deemed appropriate by the agency.

Grades (MCC Section 24.04.120)
Grades shall not exceed eighteen percent on minor and limited residential roads. Continuous steep grades shall be avoided.

Turnarounds (MCC Section 24.04.150)
(a) The end of a cul-de-sac road shall be provided with a turnaround...provided that the appropriate radius is used. Measurement shall be to face of curb or, where no curb is proposed, to six inches inboard of the proposed edge of pavement.

Private roads (MCC Section 24.04.230)
Private roads shall be constructed to the standards specified in this chapter with the following additional requirements:

(b) When a private road is proposed to extend off the end of a public road, the public road shall have a turnaround.

Exceptions
The Marin County Code states that “under certain circumstances, reductions in these standards may be allowed in accordance with Section 24.15.010 of this title.” The section states that “the agency will only approve such designs if it can be demonstrated to the satisfaction of the agency that the design containing nonconforming elements will perform at least as well as the standard design and will not jeopardize the public health, safety or welfare.”

Request for Exception by Applicant
As a part of the project application the applicant has requested an exception to the County standards, consistent with MCC Section 24.15.010. The request states that the nonconforming design elements have been proposed in order to minimize the extent of earthwork and impervious surfaces and the negative environmental impacts associated with these activities. Constructing these roads to meet the standards would result in considerably more grading and impervious surface.

Analysis
There are three proposed roads: Ridge Road, Mt. Tiburon Court, and Forest Glen Court. Ridge Road would provide direct access to 13 houses, Mt. Tiburon Court would provide direct access to ten houses and Forest Glen Court would provide direct access to seven houses. Based on the number of houses

59 Comparison of Published Road Standards and Proposed Road Design, W-Trans, April 2, 2009.
served by these roads, each would be considered a minor residential road (per MCC, minor residential roads serve from seven to 19 dwelling units).

Each of the three roads is proposed as a 20-foot wide paved road with no shoulders. The proposed road width would be less than the MCC standard of a minimum 28 foot paved width for minor residential roads.

The proposed temporary construction access road (to be used long-term only as a gated emergency egress) would not conform to the County standard for road grade. Grades steeper than 18 percent raise safety concerns, particularly for the heaviest emergency equipment (such as fire tanker trucks loaded with water and equipment, ladder trucks loaded with personnel and equipment, etc.).

The proposed 20-foot wide paved roads with no shoulders raise the following safety concerns:

- No widening of the travel lane beyond the minimum TFPD required width is shown for driveways or roads, other than widening for cul-de-sac or turnarounds near the road terminus, although there are numerous winding road and driveway segments which would traverse vertical and / or horizontal curves. As stated in the Marin County Code, the design of a road shall take into account the combined effect of the individual elements (e.g., centerline radii, grade, cross-slope) in making up the total road. Care shall be taken to avoid combining individual design elements at the extreme limits of acceptability along the same section of road (Section 24.404.235). This code section refers to the challenge presented by roads with combined vertical and horizontal curvature. Steeper grades, especially through winding road sections, are more challenging for the driver. A wider road section is needed through steep and / or curving road segments to provide the driver a greater measure of forgiveness in steering through curves - to increase drivers’ margin of error - whether the widening is achieved with a wider travel way or widened shoulders. Widened segments can also provide refuge for pedestrians and bicyclists separate from the travel lane, or allow room for a driver to stop temporarily, and pull fully or partially, out of the travel way. This could be a critical width issue (safety issue) in the event of the need for an emergency vehicle to pass a passenger vehicle traveling in the opposite direction through a narrow, constrained road section.

- No system of pedestrian pathways is proposed to provide access throughout the development. With no system of pathways, no sidewalks provided and no consistent system of road shoulders (e.g., shoulders wide enough for pedestrians to walk outside the vehicular travel way), there would be no safe passage for pedestrian movement.

These safety concerns would be significant impacts.

**Mitigation Measure 5.1-11** In order to reduce these significant road design impacts, the PDP shall be revised to incorporate the following measures:

- Design the three on-site roads (Ridge Road, Mt. Tiburon Court and Forest Glen Court) in compliance with county standards. The Marin County standard for minor residential roads is a minimum 28 foot paved width including four-foot shoulders on each side, unless narrower dimensions are allowed by the County based on its review of specific road segments.

- Provide pedestrian sidewalks or all-weather pathways on one side of all roads.

  - **Exhibit 5.1-44** illustrates two possible road sections consistent with the county standards. One shows a road section without a sidewalk, the other with a sidewalk.
Minor Residential Roads Consistent with the County Standards

Source: Marin Department of Public Works, March 24, 2010
• In order to create and maintain safe access intersections along Forest Glen Court, combine or redesign access drives to Lots 27 and 28 and Lots 32 and 33 to avoid driveways located along unsafe “blind” curves, per MCC Sections 24.04.060 (b), and (c). Caltrans stopping sight distance safety criteria shall be followed to determine minimum allowable sight distances.

**Secondary Impacts of Mitigation Measure 5.1-11**

As discussed above, each of the three on-site roads is proposed as a 20-foot wide paved road with no shoulders. Mitigation Measure 5.1-11 requires that each on-site road be constructed to meet the County’s minimum standard for minor residential roads which is a 28 foot paved width. Construction of the on-site roads with a minimum 28 foot paved width versus a 20-foot paved width could result in secondary impacts related primarily to geology and soils, hydrology and water quality, and biological resources impacts. These are discussed below:

**Geology and Soils**

Because the roads are primarily sited along ridges minimal additional grading would be required. As shown in Exhibit 3.0-10 it is estimated that on-site road grading would result in 11,010 cubic yards of cut and the need for 4,156 cubic yards of fill. It is estimated that the wider roads would result in an additional approximately 600 cubic yards of cut and 100 cubic yards of fill. Because the roads are proposed to be located primarily along the ridges, most of the additional grading would be cut into firm Franciscan Bedrock.

**Conceptual Geologic Repair**

As proposed, the vast majority of the landslide and geologic repairs would be located on slopes and not on the ridge tops. The ridges are mostly comprised of hard bedrock with generally good stability. Because the roads would remain primarily on the ridges the wider roads are not anticipated to have any measureable effect on slope stability or the proposed landslide stabilization. Therefore, the wider roads would not be anticipated to necessitate any modifications in the proposed landslide repairs.

**Hydrology and Water Quality**

**Impact on Water Quality**

For the proposed project, the increase in paved or compacted road and shoulder / sidewalk width from 20 to 28 feet would increase the road impervious area by 40 percent in each of the component watersheds. For most site lots, the roads comprise 20 to 30 percent of the total buildable area. However, since the volume of traffic would presumably remain unchanged, the loading of water quality contaminants in roadway runoff would also be unaffected by the expansion in roadway widths.

**Impact on On-Site Drainage Patterns**

The increase in road width associated with Mitigation Measure 5.1-11 would increase the watershed area subject to road drainage capture and its transfer to points of more concentrated stormwater discharge. Such expanded road widths would also decrease the quantity of rainfall infiltrating into site soils, albeit slightly, relative to the road configuration for the proposed project. This would proportionally increase the volume of surface runoff generated on-site for a given storm event, in effect increasing the rate of conversion of potential shallow groundwater to surface water.
5.1 Transportation

2008 Easton Point Residential Development Draft EIR

Impact on Erosion and Sedimentation

The expanded road widths associated with Mitigation Measure 5.1-11 would not significantly impact erosion or downstream sedimentation as long as it remains feasible to detain the appropriate differential runoff volumes and mitigate for increases in peak flow rates, both of which would be exacerbated by the increase in constructed road width. While the extent of impervious surface area would increase, the road expansions would not result in discernable increases in graded and disturbed areas. It is more likely that retaining wall heights would be increased to minimize the construction of extensive road fill slopes. If detention facilities serving the roads and some of the individual lots cannot be upsized to the extent required to detain the increased stormwater runoff volumes, then erosion of receiving drainageways could be significantly increased. In that case, downstream sedimentation could also increase relative to the proposed project road configuration.

Impact on Groundwater Recharge and On-Site Hydrology

As noted above under the On-Site Drainage Patterns discussion, the expanded road widths would decrease the quantity of infiltrated rainfall within the site watersheds and would increase peak flow rates and stormwater runoff volumes. This impact would accordingly decrease the quantity of groundwater recharge. Since the bulk of the roads are aligned along ridgelines, the impact of this loss of recharge would be apportioned amongst the various major on-site watersheds, i.e. draining to Keil Pond, Keil Cove, North San Francisco Bay, and Railroad Marsh. However, the most significant impact would occur in on-site Watershed C, which drains to Railroad Marsh. Given the extent of road area relative to the watershed area, Watershed C would experience a more significant local impact than other on-site watersheds. The expansion of Mt. Tiburon Court, while also aligned along the main site ridgeline, would potentially have a more significant impact on Keil Spring recharge than the proposed project road configuration. This would proportionally increase the already high likelihood that the project would have a deleterious impact on the Spring.

Impact on Groundwater Recharge and Off-Site Hydrology

The expansion of the road width would decrease the quantity of rainfall infiltration on-site and convert an even higher portion of the site groundwater to surface water. The significance of this increased rate of conversion would be greater in the absence of the proposed landslide dewatering facilities. Since these facilities would accrue regardless of road widths, the road expansions would have a less-than-significant impact on the bulk off-site groundwater resources, including the Keil property cisterns. The potential impact on Keil Spring, also an off-site hydrologic resource, is discussed in the next section below.

Impact on Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply

As noted above, the increase in road widths would not exacerbate the impact on the bulk of the off-site hydrologic resources due to the overriding influence of the landslide-based dewatering systems. In other words, the dewatering systems would induce the significant impact and the additional area conversion to impervious surfaces would be of less consequence. For the inholding that encompasses Keil Spring, the expanded road width along Mt. Tiburon Court, upslope of the spring, could proportionally increase the likelihood that the project would reduce Spring yields, although the impact would remain significant.
Impact on On-site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection

The expanded road widths would increase both local peak flow rates and differential (pre- versus post-project) stormwater runoff volumes relative to the proposed project road configuration. To maintain the proposed runoff and peak flow mitigation program associated with the proposed project, the capacities of the road detention facilities would require significant upsizing. These increased capacities would be necessary to prevent drainageway scour and related hillslope erosion, as well as downstream sedimentation which could obstruct road culverts along Paradise Drive and episodic road flooding.

Biological Resources

The increase in road widths, as required in this mitigation measure, could result in secondary impacts to biological resources.

Along Ridge Road and Mt. Tiburon Court, areas that would be impacted by the expanded road widths support grassland habitat (serpentine and non-serpentine) and scrub habitat that occurs within the building sites and private use areas of adjacent lots. As described in Section 5.6 Biological Resources this EIR has made an assumption that such habitats would be lost either directly as a result of project implementation or over time as a result in the conversion of such habitats to other uses by individual lot owners. The widening of these two roads, therefore, would not result in new impacts are not already analyzed for the proposed project.

Widening of Forest Glen Court would encroach both within the building site areas and private use areas of Lots 25 through 34 which currently support predominantly woodland habitat. Within private use areas, this encroachment would result in the loss of woodland habitat, and trees, many of which are native trees and considered ordinance-size. To some extent, this impact is already analyzed as a “worst case scenario” for the proposed project, i.e. assuming that individual lot owners would remove woodland vegetation from all areas of their lots, inclusive of the private use areas. Even in the worst case scenario as described that would ultimately result in the loss of 12.8 acres of woodland habitat, the applicant has proposed preserving woodland habitat at a 3:1 preservation:loss ratio in Parcel A which would mitigate this loss to a less-than-significant level if other woodland mitigations were implemented including a Resource Management Plan (RMP). Under a “best case scenario”, i.e. that private lot owners would retain most woodland vegetation and trees in their private use areas (which is considered more likely than the worst case scenario), the encroachment into these private use areas as a result of the widening of Forest Glen Court would bring woodland and tree impacts closer to the worst case scenario.

Significance After Mitigation Implementation of Mitigation Measure 5.1-11 would reduce the severity of the project's on-site road safety impacts to a less-than-significant level.

Responsibility and Monitoring The applicant would be responsible for designing on-site roads to incorporate the required road lane widths and shoulder space. The County would be responsible for monitoring implementation of these measures before issuing building permits.
Impact 5.1-12 Provision of On-Site Parking Space

The project would create a demand for parking spaces. This would be a less-than-significant impact per Marin County Code requirements, but would raise concerns for road safety due to the narrowness and steepness of on-site roads and the tendency of residents and visitors to park near their destination while ignoring on-street parking prohibitions. This would be a significant impact.

The Marin County Code Title 24 provides controlling standards for all aspects of the proposed project. The following are code sections relevant to parking on the project site.

On-Site Parking

Marin County Code 24.04.340 - Minimum required parking spaces, requires parking as follows:

Minimum off-street parking spaces shall be provided for buildings or uses according to the following schedule. Where a parcel includes two or more uses, the parking requirements shall be the aggregate of the requirement for each individual use. Parking studies may be required for unique uses or where the following guidelines may not be appropriate to the specific project proposed.

(a) For detached single-family dwellings and duplexes, two parking spaces per unit are required. Where the units are more than one hundred feet from the access street or where on-street parking is restricted or nonexistent, additional spaces may be required.

(b) For second units, the number of extra spaces shall be as required by Chapter 22.97 of the Marin County Code or by the relevant board of supervisors’ resolution. If the local ordinance does not have specific parking requirements, then two extra spaces are required in addition to the spaces required for the main residence for a total minimum of four on-site spaces. Available curb or shoulder parking along the property's street frontage may be credited toward the required extra parking where found appropriate by the agency.

County staff indicates that four spaces would be required on each residential lot to comply with minimum code requirements. However, in any development with steep, narrow roads where on-street parking is restricted throughout most of the site, the adequacy of on-lot parking is a safety concern. The safety concern results in part due to large houses with several bedrooms may result in a higher than average number of vehicles per house, or occasional to frequent need for many guest parking spaces. Guests in many of the houses would not have the option of parking on-street, as there are relatively few proposed parking bays. Absent other options for parking off-site, guests would result in a need for a greater than standard amount of on-lot guest parking or nearby access to parking bays. Without adequate off-street parking individuals may park along the proposed roads and obstruct the travel lane for fire and other emergency vehicles.

The Precise Development Plan’s circulation plan shows the number of parking spaces per lot, along with parking bays proposed along roads and driveways. The proposed project would meet the County-required code minimum on all but two lots (Lot 21 and Lot 22 would have three on-lot parking spaces

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60 Crane Transportation Group communication with Berenice Davidson, Engineer, Marin County, May 2010.

rather than the County-required four spaces). The majority of lots, however, would have insufficient parking space to address safety concerns.

There are a total of eight parking bay spaces provided throughout the site: six parking spaces are proposed in three parking bays along Ridge Road at Lots 12, 13, and 17, and two parking spaces are proposed in a single parking bay at Lot 22 on the driveway to Lots 21 through 23. Due to the narrowness of proposed roads, on-street parking would be restricted (other than within parking bays) in order to maintain clear fire and emergency access. However, additional guest spaces would be needed, on the order of an additional four spaces per lot (for a total of eight spaces per lot), to accommodate a moderate size gathering or party on any one of the lots.

**Exhibit 5.1-45** provides a list of parking spaces per lot, along with notes on the number of parking bay spaces provided along the road or driveway within 850 feet (a three-minute uphill walking distance) of the driveway entrance to each lot.

**Exhibit 5.1-45**

*Proposed Parking Spaces Per Lot*

<table>
<thead>
<tr>
<th>Lot Number</th>
<th>Number of parking spaces provided for each lot</th>
<th>Number of on-site parking bay spaces within 850 feet (approx three-minute walking distance) of the Lot driveway</th>
<th>Are eight or more on-site parking spaces available to this Lot (within 850 feet of the Lot driveway)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>0</td>
<td>No – deficient by four parking spaces.</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>0</td>
<td>No – deficient by four parking spaces.</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
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<td>No – deficient by four parking spaces.</td>
</tr>
<tr>
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<td>4</td>
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<td>No – deficient by four parking spaces.</td>
</tr>
<tr>
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</tr>
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<td>2 - Ridge Road Parking Bay at Lot 12</td>
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<tr>
<td>Lot Number</td>
<td>Number of parking spaces provided for each lot</td>
<td>Number of on-site parking bay spaces within 850 feet (approx three-minute walking distance) of the Lot driveway</td>
<td>Are eight or more on-site parking spaces available to this Lot (within 850 feet of the Lot driveway)?</td>
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<td>------------------------------------------------------------------------------------------------</td>
</tr>
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<tr>
<td>20</td>
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<td>No – deficient by two parking spaces.</td>
</tr>
<tr>
<td>21</td>
<td>3</td>
<td>2 - Parking Bay at Lot 22</td>
<td>No – deficient by three parking spaces.</td>
</tr>
<tr>
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<td>3</td>
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</tr>
<tr>
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<td>4</td>
<td>2 - Parking Bay at Lot 22</td>
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<tr>
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</tr>
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<td>No – deficient by four parking spaces.</td>
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<tr>
<td>35</td>
<td>4</td>
<td>2 - Ridge Road Parking Bay</td>
<td>No – deficient by two parking spaces.</td>
</tr>
</tbody>
</table>
5.1 Transportation

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<table>
<thead>
<tr>
<th>Lot Number</th>
<th>Number of parking spaces provided for each lot</th>
<th>Number of on-site parking bay spaces within 850 feet (approx three-minute walking distance) of the Lot driveway</th>
<th>Are eight or more on-site parking spaces available to this Lot (within 850 feet of the Lot driveway)?</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td>Bay at Lot 12</td>
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<td>43</td>
<td>4</td>
<td>2 - Ridge Road Parking Bay at Lot 12</td>
<td>No – deficient by two parking spaces.</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

As shown in Exhibit 5.1-45, by applying a standard of eight parking spaces per lot, with four spaces on the lot, and the other four spaces either on the lot, or within a three-minute walking distance of the lot, Lots 10 through 19 would meet the standard. All other lots would have deficient parking by two to four spaces.

**Mitigation Measure 5.1-12** The proposed project shall provide additional on-site parking to accommodate anticipated parking demands. Each residential site shall provide four on-site parking spaces as required by the MCC, plus four additional spaces through the use of parking areas within the building site and on-lot driveway space. As an alternative, the PDP could be revised to provide on-street parking bays or a combination of parking bays plus on-lot spaces. Developers of individual lots shall show that in addition to the four on-lot spaces required by the MCC, each lot has adequate space for four additional on-lot parking spaces or an equivalent number of parking spaces in parking bays within a three-minute walking distance (850 feet) of each residence.

**Significance After Mitigation** Implementation of Mitigation Measure 5.1-12 would reduce parking impacts to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for incorporating the on-lot and/or parking bay parking requirement into the CC&Rs, and individual lot owners or developers of lot clusters would be responsible for implementing Mitigation Measure 5.1-12. The County would be responsible for monitoring implementation of this measure when reviewing building permit applications.
Impact 5.1-13  Construction Traffic Impacts

The project could add significant amounts of construction traffic to Paradise Drive, adding to the existing sight distance safety concerns at the Paradise Drive / Forest Glen Court intersection, and raising safety concerns about construction truck use of Paradise Drive (related to tight curves and narrow segments of the road where large trucks would wander into the opposite direction travel lane). Construction trips also would damage pavement on affected roads and have the potential to disrupt the residential environment. This would be a significant impact.

Project construction traffic impacts would result from construction worker traffic, haul trucks, and earthmoving equipment associated with initial site grading, landslide repair, and construction of the temporary construction access road, on-site roads and site infrastructure. Housing construction would result in trips by building material delivery trucks and construction workers. The number of construction worker trips to and from the site would fluctuate, depending on the activity and number of units being built at any one time.

Chapter 3.0 Description of the Proposed Project summarizes the applicant’s proposed construction phasing. As a part of the Precise Development Plan a Construction Management Plan has been prepared. The Construction Management Plan includes traffic control measures to reduce traffic congestion that would minimize congestion and truck idling times on roads near residences.

Initially, Forest Glen Court would be constructed from Paradise Drive to the MMWD water tank, and a 1,600 foot long, ten-foot wide temporary construction access road would be constructed between the Forest Glen Court cul-de-sac and the boundary of Lot 39 (near the Mt. Tiburon Court cul-de-sac). The construction access road is proposed to have heavily grooved, concrete pavement to maximize tire traction, with one-foot wide shoulders and turnouts every 400 feet. It would have 25 percent maximum grades with 50-foot minimum radius curves. The construction access road would not conform to County standards for roads (e.g., County standards establish the maximum gradient for roads at 18 percent, per MCC Section 24.04.120 Grades, and states that continuous steep grades shall be avoided). The construction access road would be designed for the exclusive use of construction vehicles. Access would be blocked, for all uses other than construction or emergency access. The applicant requested review by two local construction contractors, Ghilotti Construction Company and Red Horse Constructors, Incorporated. Ghilotti Construction provided the following evaluation:

Upon review, it is Ghilotti Construction’s opinion that this road would be adequate as the primary construction access for this project, provided the following recommendations are followed:

- The actual construction of this 1,600 foot road may require staging points every 400-500 feet, which may encroach beyond the dashed lines shown on Sheet C-10 and may require initially utilizing Ridge Road for access.
- Installation of some type of barrier (Temporary K-Rail, Metal Beam Guard Rail, etc.) to be securely anchored on the outboard and downward edges of all road curves.
- As a precautionary measure, provide for the installation of an emergency stop / crash cushion array located in the center of the Forest Glen Court cul-de-sac.

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63 Letter from Bradford Simpkins, Vice President, Ghilotti Construction Company, op. cit.
• One-way radio controlled access to be maintained during construction activity.

Red Horse Constructors, Inc. provided further evaluation: 64

• Upon review of the CSW Stuber-Stroeh design documents and Ghilotti letter of April 9, 2009, the construction access road as designed appears to be suitable for use as access to the upper areas of the site from Forest Glen Court for the purposes of individual lot development and residence construction. The care and custody of the road as outlined in the Ghilotti letter would be mimicked, i.e., radio controlled access, stop / crash cushions, etc., and we would also institute construction speed limit signs, access protocols and emergency vehicle access procedures as part of the overall site safety program. The fact that the road will be paved will provide an all-weather access and not require dust [suppression]. The traffic control and construction access management plan that will be drafted for the project’s construction will be greatly served by this road access off of Paradise which avoids sensitive neighborhood streets.

• Another desirable aspect of this road is the ability to have a secured and controlled access point during buildout which will assist in site traffic control during construction hours and security of the site in off hours.

Based on a review of the information provided by Ghilotti Construction Company and Red Horse Constructors, Incorporated, the EIR traffic analyst concurs with the recommendations regarding extra safety measures being needed for the construction access road. However, the road would remain a potential safety hazard for users of the road, as it would not be in compliance with TFPD or Marin County standards for roads, and would be considered unsafe for use by public or TFPD vehicles. The TFPD has noted that requiring construction vehicles delivering heavy construction materials to use the construction access road with the proposed steep grades would create a safety hazard. 65 As discussed in Impact 5.1-9 Project Impacts Related to Project Site Emergency Access this would be a significant impact.

The applicant’s proposal to gate the road and control all uses of the road, as recommended by Ghilotti and Red Horse Construction, are considered by the EIR analyst to be necessary safety precautions.

CONSTRUCTION PHASING

The construction access road would be the primary access to the site for construction vehicles. Construction truck traffic would access the project site via Paradise Drive. Lots 21, 22, and 23 would be accessed directly from Paradise Drive the rest of the project site would be accessed via Forest Glen Court and the construction access road. Lots 1, 2, and 3 would be accessed via the construction access road and then via Ridge Road and Mountain View Drive.

Applicant-initiated construction would include the roads and infrastructure. This construction would occur in two phases. Phase One would involve six to eight months of activity for construction of


Forest Glen Court, realigning the water line, building a new water tank, building the construction access road, retaining walls, and paving. Construction of the construction access road may require initially utilizing Ridge Road for access. The construction access road would be the access to the site for construction vehicles, including earth moving, construction materials, and work crews. The on-site construction equipment for this phase would include one dozer, one excavator, a blade grader, one small compactor, and one water truck. There would be additional truck trips for delivering lumber, rebar and other retaining wall materials. Much of the cut material (excavated soil and rock) from the lower site areas would be needed on the upper site areas, so would be stock-piled in the vicinity of Lots 20 and 24; only the excess cut material would be hauled off-site. The intent is that there would be no import of fill for home building at any stage of construction.

Phase Two would include a 12-month construction period of clearing, grubbing, grading, landslide repair, subdivision road extensions, utility replacement (including installation of pipelines, drop inlets, fire hydrants, electric and cable utility infrastructure) for lots adjacent to the Hill Haven neighborhood. Drainage and utility extensions would also be constructed in this phase. Crews would consist of six to eight workers, utilizing two to three crew vehicles daily. The on-site construction equipment for this phase would be one dozer, one excavator, a blade grader, one small compactor, and one water truck.

A maximum of six to eight workers would be on the job simultaneously during each phase. At 1.3 persons per vehicle (assuming limited carpooling would take place), this would amount to five to seven construction worker vehicles arriving and departing each weekday. If carpooling is successful for workers during these phases, then the applicant’s projected two to three worker vehicles may be more accurate. The hour of arrival likely would be 6:00 to 7:00 AM (summertime schedule), and departures likely would occur between 3:00 and 4:00 PM. The applicant proposes to mitigate inconvenience to neighbors and to protect public safety by designating a disturbance coordinator and implementing the traffic control measures discussed below:

**Disturbance Coordinator**

Designate a Disturbance Coordinator for the duration of applicant-implemented construction, and also incorporate in the CC&Rs the responsibility of the Property Owners’ Association to designate a Disturbance Coordinator for the duration of lot-owner construction until full buildout. The Disturbance Coordinator shall:

a. Receive and act on complaints about construction disturbances during infrastructure installation, landslide repair, road building, residential construction, and other construction activities.

b. Determine the cause(s) and implement remedial measures as necessary to alleviate significant problems.

c. Clearly post his / her name and phone number(s) on a sign at each construction site.

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66 Letter from Bradford Simpkins, Vice President, Ghilotti Construction Company, *op. cit.*

Traffic Control Measures

a. Coordinate access with the Town of Tiburon.

b. Notify area residents of construction control activities, schedule and impacts. Post signs on streets to prohibit parking on street during project construction hours.

c. Develop a comprehensive traffic control plan to limit daily construction vehicle trips. For example, workers’ meals may be brought to the site by a vendor rather than having workers leave for lunch.

d. Accelerate grading and site preparation to the greatest extent possible for those portions of the project (Lots 1, 2, and 3) which require access through the existing Hill Haven neighborhood. Condense grading operations to the shortest period feasible.

e. Schedule delivery of construction materials and arrival of construction workers to avoid AM and PM peak hour traffic times. Station flag persons at intersections along truck routes to ensure safe truck passage.

f. Encourage construction workers to carpool.

g. Provide an on-site parking plan for all construction workers who drive to the site and for all construction vehicles. Store all building materials on-site.

h. Coordinate construction phases in order to consolidate the delivery of materials and the use of construction vehicles to the greatest extent possible. For example, once construction equipment is on-site, it should remain on-site until all uses for such equipment are complete in order to avoid bringing equipment in and out of the site for each task.

i. The project proposes designation of a Disturbance Coordinator who would post a number for access during construction hours.

j. Based on a before-and-after road evaluation conducted by County Public Works, repair any pavement deterioration which results from construction vehicle activity (MCC Section 24.04.016 Repairs to Existing Facilities).

Construction worker traffic would mostly be oriented inbound to the site in the morning and outbound from the site in the afternoon. Virtually all workers and haul truck trips would be expected to travel to and from the site on Paradise Drive-Tiburon Boulevard. The exact number of workers would depend on the amount of grading and building activity underway at any one time. Construction worker traffic flow generally would occur in the off-peak direction and should produce no significant operational impacts along Paradise Drive-Tiburon Boulevard. Some off-site haul truck trips would coincide with peak traffic flow but would not be expected to result in operational impacts along Paradise Drive or Tiburon Boulevard. Construction-related trips at the Paradise Drive / Forest Glen Court intersection would raise sight distance safety concerns, adding to existing sight distance safety conditions at this intersection. This would be a significant impact.

Trucks delivering or hauling materials to the site would arrive and depart throughout the day. Virtually all would travel to and from the west on Paradise Drive-Tiburon Boulevard and would
produce only minor (insignificant) impacts (such as slower trips through curves and slow acceleration from signals and stops along Tiburon Boulevard and Paradise Drive).

The amount of construction truck traffic would vary on a day-to-day basis depending on the construction activities occurring at any given time. For example, more construction truck traffic would result during the road paving phase of the project, as opposed to the planting and cleanup phase of the project when substantially fewer trips would be required. During site preparation and grading phases of the project, construction trucks would be required to import and export fill as well as to import materials such as precast blocks, concrete, lumber and rebar for use in constructing retaining walls. Construction trucks would also be necessary when utilities are installed to import concrete for the water tank construction, and other materials necessary to complete the proposed pipelines and drainage improvements. During the road paving phase of the project, it is anticipated that approximately 700 trucks would be required to import base rock and concrete to the site. Construction truck traffic would be expected to be substantially lower during the planting and cleanup phase of the project. Construction truck traffic expected during individual home construction would be even less, averaging only a few truck trips per day. The road paving phase of the project would yield the highest number of trucks per day. Assuming Phases 1 and 2 would each require 350 trucks (700 inbound and outbound trips) in approximately 20 workdays, it is anticipated that there would be approximately 36 inbound and outbound truck trips on a daily basis. On average, over the course of an eight-hour workday, there would be four to six inbound plus outbound truck trips in any one hour.

It is estimated that site development (access, utility installation and landslide stabilization) would generate a “surplus” of 6,499 cubic yards of cut material (excavated soil and rock). Assuming 20 cubic yard trucks, this would equate to 325 truck trips. However, it is proposed to store some of the excavated material on site (2,863 cubic yards) to be used for the fill necessary for house construction resulting in 3,636 cubic yards to be hauled off-site. Approximately 182 truck loads would be required to remove this material. Each truck would generate an inbound and an outbound trip, thus, truck trips would total 364 (182 inbound and 182 outbound) for the site development construction phase. The grading in Phase 1 is expected to last three months and the grading in Phase 2 is anticipated to last four months. Assuming 20 workdays per month, the removal of the “surplus” cut material would require one to two trucks loads per day (two to four truck trips per day). All trips would be routed along Paradise Drive.

For purposes of this analysis, post-Phase 1, with a finished construction access road connecting to Forest Glen Court, it is assumed that all construction vehicles working on lots with access via Mountain View Drive and Ridge Road would be accessed via Forest Glen Court and Paradise Drive. No on-site construction traffic would be routed via existing Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets with the exception of the upper elevations of Ridge Road and Mountain View Drive, which would be necessary for access to Lots 1, 2, and 3. For this reason, the applicant proposes to accelerate grading and site preparation to the greatest extent possible for those portions of the project (Lots 1, 2, and 3) which require access through the existing Hill Haven neighborhood. It is proposed to condense grading operations to the “shortest period feasible.” If routed through these neighborhoods, truck trips would be very noticeable to residents at home during construction hours and would result in a significant intrusion in these neighborhoods. Uphill and downhill movement of construction trucks is currently noticed by residents (noise, obstruction of sight distance for cars following behind large trucks, temporary obstruction of progress through intersections too constrained to accommodate large truck turning movements, etc.), and any increase in truck activity would be considered a serious traffic hazard (as is the case today). This would be considered a significant temporary impact to traffic flow and road safety in the neighborhood, especially through the narrowest and steepest roads, Diviso Street (as narrow as 16.5 feet wide) and Centro West and Centro East streets (as narrow as 17 feet wide). These road widths are not sufficient to allow two trucks or a truck
and a car traveling in opposite directions to pass one another safely. These would be significant impacts if construction was not limited to the Paradise Drive-Forest Glen Court route.

Pavement on Tiburon Drive - Paradise Drive could deteriorate during project construction. Such deterioration could lead to safety hazards.

Mitigation Measure 5.1-13 The following measures shall be implemented to mitigate construction traffic impacts:

Mitigation Measure 5.1-13(a) The applicant shall implement all measures regarding the construction access road as proposed by Ghilotti Construction Company and Red Horse Constructors, Incorporated.

Mitigation Measure 5.1-13(b) Implement the Construction Management Plan as set forth in the Precise Development Plan and as modified as follows

- Prohibit construction worker, construction vehicle and all other construction activity through existing residential neighborhoods, with the exception of access to Lots 1, 2, and 3 which require use of the upper elevations of Ridge Road and Mountain View Drive.

- Control all uses of the temporary construction access road as a constant safety precaution.

- Implement all project traffic control elements including consolidating delivery of construction materials using routes approved by Marin County and Town of Tiburon, informing Town of Tiburon residents of construction activities and duration, and providing a comprehensive network of flag persons along construction routes. Specifically, care shall be taken to insure safe passage of trucks along designated routes (such as Paradise Drive) by use of flag trucks traveling in front of and behind wide trucks (trucks which may intrude into the opposite direction travel lane). Flag persons shall be stationed along all road segments which may require stopping through traffic for safe truck passage or guiding trucks through existing streets.

- During the project’s initial construction phase, construct a Paradise Drive northbound left-turn lane, widen the Forest Glen Court eastbound intersection approach, and grade back the hillside to provide adequate sight distances (minimum 158 feet in each direction). Throughout this phase, flag persons shall be used to insure safety and optimize the flow of through traffic along Paradise Drive.

- Include provisions in contractors’ construction contracts to prohibit parking of construction vehicles anywhere other than on-site.

- In the unlikely event that construction vehicles arrive at the proposed Forest Glen Court site access in sufficient numbers to result in trucks queuing (stacking) in the Paradise Drive through traffic lane, post flagmen on both sides of the queue to coordinate the safe flow of through traffic past the Forest Glen Court site entrance.

- Repair any deteriorated pavement along Tiburon Drive - Paradise Drive identified in cooperation with the Town of Tiburon and Marin County by a before and after pavement evaluation program which shall determine if project-generated truck traffic caused any additional pavement deterioration.

- Obtain County and Town approval for construction truck haul routes and establish haul truck hours for project construction traffic.
Significance After Mitigation  Implementation of Mitigation Measure 5.1-13 would reduce the construction traffic impacts to a less-than-significant level.

Responsibility and Monitoring  The applicant would be responsible for improving the Paradise Drive / Forest Glen Court intersection to provide adequate sight distance, including provisions concerning construction trip operations in contractor’s contracts, and implementing conclusions from the program to document pavement conditions on Tiburon Boulevard - Paradise Drive. The County, in consultation with the Town of Tiburon, would monitor these measures.
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5.2 AIR QUALITY
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Air Quality – Environmental Setting

REGIONAL AIR QUALITY

Marin County is part of the nine-county San Francisco Bay Air Basin. The Federal Clean Air Act governs air quality in the United States. In addition to being subject to federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act. At the federal level, the United States Environmental Protection Agency (EPA) administers the Clean Air Act. The California Clean Air Act is administered by the California Air Resources Board (CARB) at the State level and by the Air Quality Management Districts at the regional and local levels. The Bay Area Air Quality Management District (BAAQMD) regulates air quality at the regional level, which includes the nine-county Bay Area.

The Bay Area is considered a non-attainment area for ground-level ozone under both the federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than ten micrometers (PM$_{10}$), and fine particulate matter that has a diameter of less than 2.5 micrometers (PM$_{2.5}$) under the California Clean Air Act, but not the federal act. The area has attained both state and federal ambient air quality standards for carbon monoxide and other air pollutants regulated under the National Ambient Air Quality Standards or California Ambient Air Quality Standards.

The BAAQMD along with the Association of Bay Area Governments and Metropolitan Transportation Commission have developed the Bay Area 2005 Ozone Attainment Strategy,¹ which is the region’s most recent clean air plan. As part of an effort to attain and maintain ambient air quality standards for ozone and PM$_{10}$, BAAQMD has established thresholds of significance for air pollutants. These thresholds are for ozone precursor pollutants (reactive organic gases and nitrogen oxides) and PM$_{10}$.

Air Pollutants

Efforts to combat air pollution began in the Bay Area in 1955 with the formation of the Bay Area Air Pollution Control District, now known as the Bay Area Air Quality Management District or BAAQMD. State and national ambient air quality standards cover a wide variety of pollutants, however, only a few of these pollutants are problems in the Bay Area either due to the strength of the emission or the climate of the region. The BAAQMD has for many years operated a multi-pollutant monitoring site in San Rafael, allowing analysis of trends in air quality. Problem air pollutants in the Tiburon area and the Bay Area include ozone, and particulate matter (PM$_{2.5}$ and PM$_{10}$), and toxic air contaminants (TACs).

¹ Bay Area 2005 Ozone Strategy, Metropolitan Transportation Commission, Bay Area Air Quality Management District and Association of Bay Area Governments, January 4, 2006.
Ozone

Ground level ozone, often referred to as smog, is not emitted directly, but is formed in the atmosphere through complex chemical reactions. Ozone is not a pollutant that adversely affects Tiburon, but emissions from motor vehicle use in the Town contribute to high ozone levels in other parts of the Bay Area. Motor vehicles are the largest source of ozone precursors emissions (i.e., nitrogen oxides and reactive organic gases) in the Bay Area. The Bay Area is currently classified as a federal and State nonattainment area for ozone.

Particulate Matter

Particulate matter is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles ten microns or less in diameter are defined as "respirable particulate matter" or "PM$_{10}$." Fine particles are 2.5 microns or less in diameter (PM$_{2.5}$). These particulates can contribute significantly to regional haze and reduction of visibility. Inhalable particulates come from smoke, dust, aerosols, and metallic oxides. Although particulates are found naturally in the air, most particulate matter found in the area is emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities, and wind erosion of disturbed areas. Most PM$_{2.5}$ is comprised of combustion products such as smoke or formed in the atmosphere from regional emissions of nitrogen oxides. There are many sources of PM$_{10}$ emissions, including combustion, industrial processes, grading and construction, and motor vehicles. The greatest quantity of PM$_{10}$ emissions associated with motor vehicle uses is generated by re-suspended road dust. Reductions in motor vehicle miles traveled are necessary to reduce PM$_{10}$ emissions, rather than changes to motor vehicle technology. Wood burning in fireplaces and stoves is another significant source of particulate matter, primarily PM$_{2.5}$.

Extensive research reviewed by CARB indicates that exposure to outdoor PM$_{10}$ and PM$_{2.5}$ levels exceeding current ambient air quality standards is associated with increased risk of hospitalization for lung and heart-related respiratory illness, including emergency room visits for asthma. Exposure to particulate matter is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between PM exposure and reduced lung function and increased respiratory symptoms and illnesses. Besides reducing visibility, the acidic portion of PM (e.g., nitrates and sulfates) can harm crops, forests, aquatic and other ecosystems. In 2002, CARB adopted new ambient air quality standards for PM$_{10}$ and PM$_{2.5}$, resulting from an extensive review of the health-based scientific literature. EPA adopted stricter standards for PM$_{2.5}$ in September 2006.

Toxic Air Contaminants (TACs)

TACs are another group of pollutants of concern in the Bay Area. Common sources of TACs include industrial processes, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Diesel particulate matter from exhaust has been identified as a TAC. Mobile sources, such as trucks, buses, and construction equipment are by far the largest source of diesel emissions. In Tiburon, truck traffic, construction equipment, and ferries are the primary sources of diesel particulate matter. According to CARB, the overall inhalation cancer risk in the Tiburon area for the year 2000 was about 100 to 250 excess cancer cases per million people. This is considerably lower than the risk

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in urban areas, which can exceed 1,000 excess cases per million people. The overall risk is predicted to decrease and the decrease could be substantial if CARB’s goals to achieve a 75-percent reduction in diesel health risk, as discussed below, are met.

In 1998, CARB formally identified particulate matter emitted from diesel-fueled engines (diesel particulate matter [DPM]) as a TAC. Diesel engines emit TACs in both gaseous and particulate forms. Diesel particulate matter is of particular concern since it is distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines include different chemicals, many of which have been identified by EPA as hazardous air pollutants and by the CARB as TACs. Diesel engines emit particulate matter at a rate much greater than comparable gasoline engines. Much of these particles are very small (i.e., PM$_{2.5}$), and therefore, can become trapped within the lung if inhaled.

In late 2000, CARB adopted a diesel risk reduction plan. The plan outlined more stringent emission standards for new on-road and non-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent. The projected emission benefits associated with full implementation of this plan, including existing and new federal measures, are reductions in cancer risks associated with DPM by 75 percent in 2010 and 85 percent by 2020. The measures in the plan would substantially reduce localized risks associated with activities that expose nearby individuals to diesel particulate matter emissions. Many of the measures of the diesel risk reduction plan have been approved and adopted, including the federal on-road and non-road diesel engine emission standards for new engines sold beginning in 2004 and 2007. Diesel fuel with ultra low sulfur content is now required for use in both on-road and non-road engines in California. CARB recently adopted regulations requiring the retrofit or replacement of construction equipment over the next ten years.

**Sensitive Receptors**

Some groups of people are more affected by air pollution than others. The State has identified the following people who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks.

**AIR QUALITY IN THE PROJECT SITE VICINITY**

The air pollution potential in Marin County is quite low due to the proximity to the San Francisco Bay and Pacific Ocean. The constant influence of marine air and lack of nearby or upwind air pollution sources results in low air pollution levels. Air pollutant levels can build up under stable atmosphere conditions, since vertical and horizontal dispersion of air pollutants is limited. However, neutral or stable conditions are typical at the project site due to the close proximity to the bay waters.

BAAQMD monitors air pollutant levels continuously throughout the Bay Area. The San Rafael station is the closest to the project site. Over the last five years, PM$_{10}$ levels measured in San Rafael have exceeded California Ambient Air Quality Standards on zero to two sample days. Since PM$_{10}$ is sampled once every six days, standards are exceeded on an estimated zero to 12 days annually. No

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other exceedances of air quality standards have been measured at the San Rafael station. PM$_{2.5}$ is not measured at the BAAQMD station in San Rafael or at any other locations in Marin County.

**GREENHOUSE GAS EMISSIONS (GHG)**

Global temperatures are affected by naturally occurring and anthropogenic-generated (generated by mankind) atmospheric gases, such as water vapor, carbon dioxide, methane, and nitrous oxide. Gases that trap heat in the atmosphere are called greenhouse gases (GHG). Solar radiation enters the earth’s atmosphere from space, and a portion of the radiation is absorbed at the surface. The earth emits this radiation back toward space as infrared radiation. Greenhouse gases, which are mostly transparent to incoming solar radiation, are effective in absorbing infrared radiation and redirecting some of this back to the earth’s surface. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This is known as the greenhouse effect. The greenhouse effect, maintains a habitable climate. Natural processes and human activities emit GHGs. Emissions from human activities, such as electricity production, motor vehicle use and agriculture are elevating the concentration of GHGs in the atmosphere, and are reported to have led to a trend of unnatural warming of the earth’s natural climate, known as global warming or climate change. Other than water vapor, the GHGs contributing to global warming include the following gases:

- Carbon dioxide, primarily a byproduct of fuel combustion.
- Nitrous oxide is a byproduct of fuel combustion and also associated with agricultural operations such as fertilization of crops.
- Methane is commonly created by off-gassing from agricultural practices (e.g. keeping livestock) and landfill operation.
- Chlorofluorocarbons that were widely used as refrigerants, propellants and cleaning solvents but their production have been mostly reduced by international treaty.
- Hydrofluorocarbons are now used as a substitute for chlorofluorocarbons in refrigeration and cooling.
- Perfluorocarbons and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semiconductor manufacturing.

Gases in the atmosphere can contribute to the greenhouse effect both directly and indirectly. Direct effects occur when the gas itself absorbs outgoing radiation. Indirect effects occur when gases cause chemical reactions that produce other GHGs or prolong the existence of other GHGs. The Global Warming Potential (GWP) concept is used to compare the ability of each GHG to trap heat in the atmosphere relative to carbon dioxide (CO$_2$), which is the most abundant GHG. CO$_2$ has a GWP of 1, expressed as CO$_2$e. Other GHGs, such as methane and nitrous oxide are commonly found in the atmosphere but at much lower concentrations. However, the GWP for methane is 21, while nitrous

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oxide has a GWP of 310. Other trace gases, such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) which are halocarbons that contain chlorine, have much greater GWPs. Fortunately these gases are found at much lower concentrations and many are being phased out as a result of global efforts to reduce destruction of stratospheric ozone. In the United States, CO₂ emissions account for about 85 percent of the CO₂e emissions, followed by methane at about eight percent and nitrous oxide at about five percent. ⁵

The world’s leading climate scientists have reached consensus that global climate change is underway, is “very likely” caused by humans, and hotter temperatures and rises in sea level “would continue for centuries,” no matter how much humans control future emissions. A report of the Intergovernmental Panel on Climate Change (IPCC) - an international group of scientists and representatives concludes that “The widespread warming of the atmosphere and ocean, together with ice-mass loss, support the conclusion that it is extremely unlikely that global climate change of the past 50 years can be explained without external forcing, and very likely that it is not due to known natural causes alone.” ⁶

Human activities have exerted a growing influence on some of the key factors that govern climate by changing the composition of the atmosphere and by modifying vegetation. The concentration of carbon dioxide in the atmosphere has increased from the burning of coal, oil, and natural gas for energy production and transportation and the removal of forests and woodlands around the world to provide space for agriculture and other human activities. Emissions of other greenhouse gases, such as methane and nitrous oxide, have also increased due to human activities. Since the Industrial Revolution (i.e., about 1750), global atmospheric concentrations of CO₂ have risen about 36 percent, due primarily to the combustion of fossil fuels.⁷

The IPCC predicts a temperature increase of between two and 11.5 degrees Fahrenheit (F) (1.1 and 6.4 degrees Celsius) by the end of the 21st century under six different scenarios of emissions and carbon dioxide equivalent concentrations. ⁸ Sea levels are predicted to rise by 0.18 to 0.59 meters (seven to 23 inches) during this time, with an additional 3.9 to 7.8 inches possible depending upon the rate of polar ice sheets melting from increased warming. The IPCC report states that the increase in hurricane and tropical cyclone strength since 1970 can likely be attributed to human-generated greenhouse gases.

**REGULATORY EFFORTS TO ADDRESS GLOBAL CLIMATE CHANGE**

Global climate change resulting from greenhouse gas emissions is an emerging environmental concern being raised and discussed at the international, national, and statewide level. At each level, agencies are considering strategies to control emissions of gases that contribute to global warming.

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⁸ Ibid.
U.S. EPA

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC). While the United States signed the Kyoto Protocol, which would have required reductions in GHGs, the Congress never ratified the protocol. The federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. In 2002, the United States announced a strategy to reduce the greenhouse gas intensity of the American economy by 18 percent over a ten-year period from 2002 to 2012. To date, the U.S. EPA has not regulated GHGs under the Clean Air Plan (note that a 2007 Supreme Court ruling held that the U.S. EPA can regulate GHG emissions). U.S. EPA plans to begin regulating GHGs when the first national rule regulating GHGs takes effect. As proposed, the first rule would limit GHG emissions from cars and light-duty trucks nationwide, beginning in 2011.

As part of the commitments to UNFCCC, the U.S. EPA has developed an inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases. This inventory is periodically updated with the latest update being 2008. EPA reports that total U.S. emissions have risen by 14.7 percent from 1990 to 2006, while the U.S. gross domestic product has increased by 59 percent over the same period. A 1.1 percent decrease was noted from 2005 to 2006, which is reported to be attributable to: (1) climate conditions, (2) reduced use of petroleum products for transportation, and (3) increased use of natural gas over other fuel sources. The inventory notes that the transportation sector emits about 33 percent of CO₂ emissions, with 60 percent of those emissions coming from personal automobile use. Residential uses, primarily from energy use, accounted for 20 percent of CO₂ emissions.

As a part of U.S. EPA’s responsibility to develop and update an inventory of U.S. GHG emissions and sinks, EPA compared trends of other various U.S. data. Over the period between 1990 and 2006, GHG emissions grew at a rate of about 0.9 percent per year. Population growth was slightly higher at 1.1 percent, while energy and fossil fuel consumption were more closely related at 1.0 percent. GDP and energy generation grew at much higher rates.

State of California

The State of California is concerned about GHG emissions and their effect on global climate change. The State recognizes that “there appears to be a close relationship between the concentration of greenhouse gases in the atmosphere and global temperatures” and that “the “evidence for climate change is overwhelming.” The effects of climate change on California, in terms of how it would affect the ecosystem and economy, remain uncertain. The State has many areas of concern regarding climate change with respect to global warming. According to the 2006 Climate Action Team Report the

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9 On April 2, 2007, the United States Supreme Court issued a 5-4 decision in Massachusetts v. EPA, which holds that the U.S. Environmental Protection Agency has authority, under the Clean Air Act, to regulate greenhouse gas emissions from new vehicles. The U.S. EPA had previously argued it lacked legal authority under the Clean Air Act to regulate greenhouse gases. The majority opinion of the Supreme Court decision noted that greenhouse gases meet the Clean Air Act’s definition of an “air pollutant,” and the EPA has the statutory authority to regulate the emission of such gases from new motor vehicles.


11 Climate Action Team Report to Governor Schwarzenegger and the Legislature, California Environmental Protection Agency. 2006. [http://www.climatechange.ca.gov/climate_action_team/reports/2006-04-03_FINAL_CAT_REPORT.PDF]
following climate change effects and conditions can be expected in California over the course of the next century:

- A diminishing Sierra snowpack declining by 70 percent to 90 percent, threatening the state’s water supply;

- Increasing temperatures from eight to 10.4 degrees Fahrenheit (F) under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas;

- Coastal erosion along the length of California and seawater intrusion into the Sacramento River Delta from a four-to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions;

- Increased vulnerability of forests due to pest infestation and increased temperatures;

- Increased challenges for the state’s important agricultural industry from water shortages, increasing temperatures, and saltwater intrusion into the Delta; and

- Increased electricity demand, particularly in the hot summer months.

California emissions of GHG gases or CO₂ equivalent emissions was estimated at 484 million metric tons of equivalent CO₂ emissions (MMTCO₂e), which is about seven percent of the emissions from the entire United States. 12 It is estimated that the United States contributes up to 35 percent of the world’s CO₂ equivalent emissions. Transportation is the largest source of GHG emissions in California, contributing about 40 percent of the emissions. Electricity generation is second at over 20 percent, but California does import electricity during the summer bringing energy sources up to about 25 percent. Industrial activities account for about 20 percent of the State’s emissions. Transportation is the largest source of greenhouse gas emissions in California, followed by industrial sources and electric power generation. 13 On a per-person basis, greenhouse gas emissions are lower in California than most other states; however, California is a populous state and the second largest emitter of greenhouse gases in the United States and one of the largest emitters in the world. 14

Under a “business as usual” scenario, emissions of GHG in California are estimated to increase to approximately 600 MMTCO₂e by 2020. CARB staff has estimated the 1990 statewide emissions level to be 427 MMTCO₂e, therefore, requiring a reduction of almost 30 percent in emissions by 2020 to meet the AB32 goal.

**State of California Executive Order S-3-05**

In June 2005, the Governor of California signed Executive Order S-3-05, which identified Cal/EPA as the lead coordinating State agency for establishing climate change emission reduction targets in California. A “Climate Action Team”, a multi-agency group of state agencies, was set up to

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13 *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, op. cit.

14 *Analysis of the 2006-07 Budget Bill (Governor’s Climate Change Initiative)*, California Legislative Analyst’s Office. 2006, (http://www.lao.ca.gov/analysis_2006/resources/res_04_anl06.html)
implement Executive Order S-3-05. Under this order, the state plans to reduce greenhouse gas emissions to 80 percent below 1990 levels by 2050. Greenhouse gas emission reduction strategies and measures to reduce global warming were identified by the California Climate Action Team in 2006. 15

Assembly Bill (AB) 32—The California Global Warming Solutions Act of 2006

In 2006, the governor of California signed AB 32, the Global Warming Solutions Act, into legislation. The Act requires that California cap its greenhouse gas emissions at 1990 levels by 2020. This legislation requires CARB to establish a program for statewide greenhouse gas emissions reporting and monitoring/enforcement of that program. CARB recently published a list of discrete greenhouse gas emissions reduction measures that can be implemented immediately. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions. CARB’s Early Action Plan identified regulations and measures that could be implemented in the near future to reduce GHG emissions.

Much of the measures to reduce GHG emissions from transportation will come from CARB. AB 1493, the Pavley Bill, directed CARB to adopt regulations to reduce emissions from new passenger vehicles. CARB’s AB32 Early Action Plan released in 2007 included a strengthening of the Pavley regulation for 2017 and included a commitment to develop a low carbon fuel standard (LCFS). In April 2009, CARB adopted the new LCFS aimed at diversifying the variety of fuels used for transportation. This regulation is designed to increase the use of alternative fuels, replacing 20 percent of the fuel used by cars in California with clean alternative fuels by 2020. These fuels include electricity, biofuels, and hydrogen.

CARB is relying on increased fuel efficiency to reduce GHG emissions substantially. California had proposed a State standard to increase the fuel economy of new cars, but implementation was hindered by the U.S. EPA. In May 2009, President Obama announced a new national policy aimed at both increasing fuel economy to reduce GHG emissions from new cars and trucks sold in the United States. The new standards would apply to new vehicles sold beginning in 2012, and ultimately require an average fuel economy standard of 35.5 miles per gallon (mpg) in 2016. This surpasses the previous 2007 standard of 35 mpg for 2020 model vehicles established in 2007. On June 30, 2009, the U.S. EPA announced that it will grant California’s waiver request enabling the State to enforce the GHG standards for new motor vehicles, beginning with the current model year.

CARB is targeting other sources of emissions. The main measures to reduce GHG emissions will be contained in the AB32 Scoping Plan. A draft of the plan was released in June 2008 and was approved in December 2008. This plan includes a range of GHG reduction actions. Central to the draft plan is a cap and trade program covering 85 percent of the state’s emissions. This program will be developed in conjunction with the Western Climate Initiative, comprised of seven states and three Canadian provinces, to create a regional carbon market. The plan also proposes that utilities produce a third of their energy from renewable sources such as wind, solar and geothermal, and proposes to expand and strengthen existing energy efficiency programs and building and appliance standards. The plan also includes full implementation of the Pavley standards to provide a wide range of less polluting and more efficient cars and trucks to consumers who will save on operating costs through reduced fuel use. It also calls for development and implementation of the Low Carbon Fuel Standard, which will require oil companies to make cleaner domestic-produced fuels. The regulatory process begins in 2009 to implement the plan. The details in regulating emissions and developing targeted fees to administer the

15 Climate Action Team Executive Summary Climate Action Team Report to Governor Schwarzenegger and the California Legislature. (http://www.climatechange.ca.gov/climate_action_team/reports/2006-04- California Environmental Protection Agency, 2006. 03_FINAL_CAT_REPORT_EXECSUMMARY.PDF)
program will be developed through this process. This will last two years and measures must be enacted by 2012.

**Senate Bill 97—Modification to the Public Resources Code**

Pursuant to Senate Bill 97, the Governor’s Office of Planning and Research (OPR) recently issued amendments to the *State CEQA Guidelines* to address GHGs. The approach includes three basic steps: (1) identify and quantify emissions; (2) assess the significance of the emissions; and (3) if emissions are significant, identify mitigation measures or alternatives that will reduce the impact to a less-than-significant level.

**California’s Energy Efficiency Standards for Residential Buildings, Title 24, Part 6, of the California Code of Regulations**

The Energy Efficiency Standards for Residential Buildings were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 2005 Standards went into effect October 1, 2005. Projects that apply for a building permit on or after this date must comply with the 2005 Standards. The 2008 Standards are currently being developed and will go into effect in 2009.

**Senate Bill 375—California’s Regional Transportation and Land Use Planning Efforts**

Recently, California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 would develop emissions-reduction goals in which regions can apply in planning activities. SB 375 provides incentives for local governments and developers to implement new conscientiously planned growth patterns. This includes incentives for creating attractive, walkable and sustainable communities and revitalizing existing communities. The legislation also allows developers to bypass certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with traffic congestion, would be encouraged. SB 375 enhances CARB’s ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB would work with the metropolitan planning organizations (e.g., ABAG and MTC) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its greenhouse gas reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

**California’s Heavy Duty Vehicle GHG Emissions Reduction Measure**

On December 12, 2008 (one day after adopting the AB32 Climate Action Plan), CARB adopted the Heavy Duty Vehicle Greenhouse Gas Emission Reduction measure that requires long-haul truckers to install fuel efficient tires and aerodynamic devices on their trailers. This measure will reduce GHG emissions through improved fuel economy.

**Marin County**

Marin County began legislative action to reduce impacts to climate change beginning in 2002 when the Board of Supervisors signed a resolution to join the Cities for Climate Protection Campaign (CCP). This campaign is administered under the International Council for Local Environmental Initiatives (ICLEI) and works to reduce greenhouse emissions through actions by local governments.
The County released their first inventory of GHG emissions in 2003 and set reduction targets later that year. A voluntary target to reduce countywide GHG emissions to 15 percent below 1990 levels by the year 2020 was set.

The County’s most recent inventory of GHG emissions was released in 2007, where 2005 emission were re-inventoried. Total Countywide greenhouse gas emissions of CO₂e were found to have increased approximately six percent between 1990 and 2005 (from 3,005,674 to 3,188,522 tons CO₂e). There was a larger increase between 1995 and the year 2000, but emissions were found to have decreased between 2000 and 2005 by about two percent. In 2005, residential emissions made up about 19 percent of the inventory. Transportation was largest contributor at 62 percent of the inventory. Residential emissions are made up of natural gas and electricity consumption. In 2005, residential emissions were found to be slightly below 1990 levels. Transportation emissions continued to grow and were found in 2005 to be about seven percent higher than 1990 levels.

The 2005 inventory identifies a reduction of 46 percent of CO₂e emissions necessary to meet the reduction targets of 15 percent below 1990 levels by 2020. Efforts to meet these goals are described in the Marin County Climate Action Plan that was adopted by the Board of Supervisors in 2006. The implementation plan is based on many policies and programs in the Marin Countywide Plan. The Single-Family Residential Design Guidelines of Marin County requires that new construction be designed to reduce energy demand. The County’s Green Building Residential Certification standards would apply to the proposed project. These requirements are a point based system that range from a silver rating for homes between 2,501 and 4,000 square feet to a platinum rating for homes over 5,500 square feet. Points are assigned to different portions of home construction requiring a more intense use of Green Building practices for larger homes. New construction would be subject to the County’s Single Family Dwelling Energy Efficiency Ordinance. The purpose of the standard is to require new single family homes to exceed the State’s 2005 Building Energy Efficiency Standards by at least 15 percent. Homes larger than 4,500 square feet are required to verify an increasing degree of energy efficiency greater than 15 percent in order to achieve energy efficiency standards comparable to that of a smaller residential dwelling.

**SCOPING COMMENTS**

Public scoping comments regarding the proposed project’s impacts to air quality were received by the County in February 2009. Concerns raised include dust from earthmoving and other construction activities; the potential for naturally occurring asbestos within serpentine rock to be released during grading activities; diesel exhaust from construction equipment; and the project’s contribution towards greenhouse gas emissions and climate change issues.

16 Marin County Building Certification Form, Marin County Community Development Agency, March 10, 2009.

5.2 Air Quality

2008 Easton Point Residential Development Draft EIR

Air Quality – Significance Criteria

The air quality analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review Guidelines. Based on the State CEQA Guidelines the project would have a significant air quality impact if it would:

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

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant environmental impact if it would:

- Cause or contribute substantially to existing or projected air quality violations.
- Result in exposure of sensitive receptors (i.e. individuals with respiratory diseases, the young, the elderly) to substantial pollutant concentrations.
- Result in toxic air contaminants that would cause a significant health risk above the Air Pollution Control District’s level of significance, if any (e.g. cancer risk of more than one in a million).

Greenhouse Gases

Based on the State CEQA Guidelines the project would have a significant greenhouse gas emissions impact if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

In June 2010 the BAAQMD adopted development guidelines that establish air quality guidelines for GHG emissions. The thresholds that would be applicable to the proposed project are as follows:

- Compliance with a qualified climate action plan or qualified general plan; or
- Annual emissions of less than 1,100 metric tons of CO₂e; or
• Annual emissions less than 4.6 metric tons of CO\textsubscript{2}e per capita (residences and employees).

Furthermore, the BAAQMD CEQA Air Quality Guidelines identify a screening threshold of 56 single-family housing units for identifying significant greenhouse gas emission impacts.
Air Quality – Impacts and Mitigation Measures

**NO OR LESS-THAN-SIGNIFICANT IMPACTS**

Based on the findings of the analyses completed as a part of this Draft EIR it has been determined that the proposed 2008 Easton Point Residential Development would have either no impact or less-than-significant impacts for the following significance criteria.

- **Conflict with or obstruct implementation of the applicable air quality plan.**

  The 2005 Bay Area Ozone Strategy accounts for growth in cities located within the Bay Area Air Quality Management District (BAAQMD) in accordance with their general plan land use designations. The proposed residential development would be consistent with County land use density requirements, and would not conflict with or obstruct implementation of the Bay Area Clean Air Plan. No impact would occur.

- **Violate any air quality standard or contribute substantially to an existing or projected air quality violation.**

  Marin County is part of a region-wide nonattainment area, in which concentrations of ground-level ozone and particulate matter exceed respective State or federal air quality standards. Standards for other air pollutants, such as carbon monoxide, are met. Ozone and particulate matter are the pollutants of primary concern when evaluating projects. Since these air pollutants are not directly emitted to the atmosphere, the significance of a project’s impact is evaluated through comparison of overall project emissions to thresholds of significance established by the BAAQMD. The BAAQMD, in its existing CEQA Guidelines, generally does not recommend a detailed air quality analysis for projects generating less than 2,000 vehicle trips per day. The screening criteria in the draft BAAQMD guidelines indicate that projects with less than 114 new single family homes would have less-than-significant exhaust emissions for construction or operation. The proposed 2008 Easton Point Residential Development includes 43 new housing units that would generate less than 500 trips per day. This is well below the existing or draft BAAQMD project screening thresholds. Based on the size of the project, operational emissions of ground-level ozone precursor pollutants and particulate matter would be well below significance thresholds and would not be expected to violate any air quality standards or contribute substantially to an existing or projected air quality violation. In addition, the construction period exhaust emissions would be below the new draft BAAQMD thresholds for construction activities. Therefore, a less-than-significant impact would occur.

- **Result in a cumulatively considerable net increase of any criteria pollutant for which the project is non-attainment under an applicable Federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).**

  As discussed above, Marin County is part of a region-wide nonattainment area, in which concentrations of ground-level ozone and particulates exceed respective State or federal air quality standards. The proposed 2008 Easton Point Residential Development would not have a significant impact to regional air quality since the project would generate air pollutant emissions
well below the existing and proposed BAAQMD significance thresholds. As a result, the project would have a less-than-significant cumulative impact to air quality.

- Create objectionable odors affecting a substantial number of people.

Residential uses of the project site would not generate any substantial odors. There are no facilities or land use activities near the site that could produce odors that would cause new odor complaints from the project. This would be a less-than-significant impact. Construction equipment associated with site grading would generate diesel exhaust emissions, which could affect a small number of people on a temporary basis. Construction activities would not result in frequent episodes of objectionable odors. This temporary impact would be less-than-significant.

**IMPACT ANALYSIS**

**Impact 5.2-1 Construction-Period Air Pollutant Emissions**

Air pollutants emitted during construction could expose nearby neighbors to unhealthy levels of particulate matter and possibly TACs. This would be a significant impact.

The BAAQMD CEQA Guidelines do not include quantified thresholds for construction period impacts. Instead, the guidelines recommend that Feasible PM$_{10}$ Control Measures, identified in the guidelines, be implemented to avoid significant impacts from construction. The guidelines also recommend that measures should be included to reduce equipment exhaust emissions. The guidelines do not recommend quantification of the temporary emissions from construction activity. Construction period air quality emissions were not quantified since the BAAQMD does not recommend quantification of these emissions, there are no significance thresholds to compare emissions, and the lead agency does not require quantification of these impacts.

Although grading, and other construction activities would be temporary, they would likely extend over at least two years, if not longer. These activities would create air emissions that would have the potential to cause both nuisance and health impacts. PM$_{10}$ is the pollutant of greatest concern associated with dust generation. If uncontrolled, PM$_{10}$ levels downwind of actively disturbed areas could create a nuisance. Most of the dust generation would result during grading activities or frequent vehicle travel on unpaved or dusty roads. The amount of dust generated would be highly variable and would be dependent on the size of the area disturbed, amount of activity, soil conditions and meteorological conditions. Typical winds during late spring through summer are from the west or southwest. Nearby residences (existing and future), especially those located to the east, could be adversely affected by dust generated during construction activities. If uncontrolled, dust generated by clearing, grading, and construction activities would represent a significant impact.

The heavy-duty construction equipment used primarily for site grading and trucks used to deliver or remove materials would be mostly diesel-fueled. The pollutant from this equipment that poses the most concern is particulate matter, PM$_{2.5}$, which is essentially diesel particulate matter or DPM. As previously indicated, DPM has been identified as a TAC by the State. Construction exhaust would also emit Oxides of Nitrogen (NOx) that may lead to regional air quality impacts. As discussed above, the proposed project would have construction period emissions below the thresholds currently proposed by BAAQMD for ozone precursor pollutants and respirable or fine particulate matter. The exhaust emissions from construction activities would be less-than-significant.
Implementation and phasing of the proposed project is described in Chapter 3.0 Description of the Proposed Project. The project applicant would construct road extensions and install infrastructure. Applicant implemented construction would occur in two phases:

- Phase One would include construction of Forest Glen Court and the realigned water line. The construction access road, retaining walls, and paving would occur in this phase. The new MMWD water tank would also be constructed.

- Phase Two would include the clearing, grubbing, grading, landslide repair, subdivision road extensions, utility placement (including installation of pipelines, drop inlets, fire hydrants, electric and cable utility infrastructure) for lots adjacent to the Hill Haven neighborhood. Drainage and utility extensions would also be constructed in this phase.

Construction of Phase One would take approximately 12 months (see Exhibit 3.0-12). Construction of Phase Two would take approximately 12 months. On-site construction equipment would be the same as Phase One. Initial site preparation and grading is expected to take up to four months in Phase One and up to six months in Phase Two. The site preparation and grading activity would likely result in most of the air pollutant emissions during the construction period. During these phases, approximately one to four pieces of equipment plus a water truck could be used simultaneously with some truck trips to import or export materials or equipment. Most of this activity would be several hundred feet from residences.

Individual house construction would occur after completion of the roads, utilities, other infrastructure and other activities in Phases One and Two. Lots 20 and/or 24 would be the last developed with housing so that either or both of these lots may be used as staging/storing areas for cut and fill materials associated with development of all other upper lots. Construction of each lot would typically require at least two pieces of equipment for grading and some truck trips including truck trips for delivery of materials. The most truck trips generated are likely to be during paving and concrete pours for retaining walls. Trucks traveling near residences would have the most notable air quality impact, since much of the project activity would be a considerable distance from residences. Emissions would be less than during the site preparation and grading tasks.

The construction access road would be the primary access to the site for construction vehicles, including earthmoving, construction materials, and work crews of all construction activities on the project site, including residential home construction. Individual lot owners when contracting for construction of a specific lot would be required to include in the construction contract a requirement that all construction access be from the construction access road.

As a part of the Precise Development Plan a Construction Management Plan has been prepared. The Construction Management Plan includes traffic control measures to reduce traffic congestion that would minimize congestion and truck idling times on roadways near residences.

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18 Exhibit 3.0-12 summarizes the approximate duration of individual construction activities and the estimated number of construction workers on-site during each activity.

19 Draft Declaration of Conditions, Covenants and Restrictions for Easton Point, project applicant, April 2009, Article V, Subsection G.

DPM is the most prevalent TAC, contributing about 70 percent to the overall potential inhalation cancer risk. Improved diesel engines technologies that are mandated along with reformulated diesel fuel are expected to substantially lower the risk from diesel exhaust. The increased health risk from these types of emissions (i.e., increased cancer risk) is calculated over a 70-year continuous exposure period at locations of sensitive receptors or residences. Truck travel and construction equipment exhaust may result in elevated levels of DPM for short time periods. However, these activities would occur for a relatively short period that the increased cancer risk would be so small that it would for all intents and purposes be immeasurable at any one particular residence.

The level of exposure from this activity would be dependent on the types of equipment and controls employed to reduce emissions. Older construction equipment can emit DPM at much greater rates than late model construction equipment that utilize particulate filters and newer engine technologies. An inhalation health risk assessment was not prepared for this project due to the highly unlikely possibility of these construction activities resulting in a significant impact. However, control measures should be implemented to ensure that DPM emissions would be low enough to not cause health risk issues at nearby residences. The impact would be significant without appropriate measures to reduce PM$_{10}$ and DPM emissions.

The Construction Management Plan includes air quality control measures. These measures are consistent with most of those recommended by the BAAQMD to reduce temporary construction air quality impacts to a less-than-significant level. However, the Construction Management Plan does not include measures to reduce diesel exhaust emissions or measures to ensure that dirt or mud would not be tracked on to public roadways. Dirt or mud tracked on to roadways can get entrained into the air from passing cars causing elevated PM$_{10}$ levels. Without modification to the Construction Management Plan, a significant impact would occur.

**Mitigation Measure 5.2-1** The applicant shall mitigate construction air quality impacts by implementing the Construction Management Plan as set forth in the Precise Development Plan and as modified as follows:

- The Construction Management Plan shall be modified to require use of off-road construction equipment that was manufactured during or after 1996 meeting the California Tier I emissions standard or is equipped with diesel particulate filters or uses alternative fuels (e.g., biodiesel) that result in lower particulate matter emissions that are at least 20 percent lower than the statewide fleet average reported by the California Air Resources Board.

- The Construction Management Plan shall be modified to prohibit the use of “dirty” equipment. Opacity is an indicator of exhaust particulate emissions from off-road diesel-powered equipment. The project shall ensure that emissions from all construction diesel-powered equipment used on the project site do not exceed 40-percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40-percent opacity (or Ringelmann 2.0) shall be repaired immediately. In essence, any piece of equipment that emits dark smoke for more than three minutes would be in violation of this mitigation measure.

- The Construction Management Plan shall be modified to ensure that diesel equipment standing idle for more than five minutes shall be turned off. This would include trucks waiting to deliver or receive soil, aggregate, or other bulk materials. Rotating drum concrete trucks could keep their engines running continuously as long as they were on-site.

- The Construction Management Plan shall be revised to include the following PM$_{10}$ control measures:
- Prevent visible tracking of mud or dirt on to public roadways or immediately sweep dirt or mud tracked on to roadways.

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

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

**Significance after Mitigation** Implementation of Mitigation Measure 5.2-1 would reduce construction-period air pollutant emissions to a less-than-significant level; since the project would implement all BAAQMD recommended PM$_{10}$ control measures for construction activities. In addition, the control measures would reduce construction-period diesel exhaust emissions so that nearby residences would not be subject to nuisance or unhealthy levels of air pollution caused by the project.

**Responsibility and Monitoring** Prior to the issuance of a grading plan, Marin County staff shall review the Construction Management Plan to ensure that the proper modifications have been made to the plan.

**Impact 5.2-2 Generation of Airborne Asbestos**

Grading of the project site may disturb soils containing serpentine, possibly releasing asbestos fibers into the air. With conformance to BAAQMD regulations this would be a less-than-significant impact.

Asbestos is a fibrous mineral that is both naturally-occurring in ultramafic or serpentine rock (a rock type commonly found in California), and is used as a processed component of building materials. Because asbestos has been proven to cause serious adverse health effects, such as asbestosis and lung cancer, it is strictly regulated either based on its natural widespread occurrence, or in its use as a building material.

Serpentine rock outcroppings are present in this portion of Marin County. These types of rock outcroppings are not common at the site. The presence of serpentine rock is described in **Section 5.4 Geology and Soils**. The serpentine present at the site generally consists of sheared rock material enclosing hard, unsheared ellipsoidal and spheroidal serpentine masses up to a few feet long. This unit is present along the southwest site boundary where it contacts Franciscan rock. This contact has been mapped as being bounded along its eastern border by a long, straight vertical fault that cuts across topography. As mapped, the serpentine material may underlie proposed Lots 1 through 8, 17 through 20, and 24. The serpentine also encroaches into access driveways for many of these lots, Ridge Road, Mt. Tiburon Road and parcels A and B. Construction could encounter serpentine, which may contain asbestos. Construction workers and others on or near the project site or people along off-site haul roads potentially could be exposed to airborne asbestos fibers.

The BAAQMD enforces regulations of construction activities in soils that may contain naturally occurring asbestos. An Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying and Surface Mining Operations was signed into State law in 2002. The purpose of this regulation is to reduce public exposure to naturally occurring asbestos from construction and mining activities that emit dust that may contain asbestos. The Asbestos ATCM requires regulated operations engaged in road construction and maintenance activities, construction and grading

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21 California Code of Regulations, Title 17, Section 93015.
operations, and quarrying and surface mining operations in areas where naturally occurring asbestos is likely to be found, to employ the best available dust mitigation measures in order to reduce and control dust emissions.

For construction and grading projects that will disturb one acre or less, the regulation requires several specific actions to minimize emissions of dust such as vehicle speed limitations, application of water prior to and during the ground disturbance, keeping storage piles wet or covered, and track-out prevention and removal. Construction projects that will disturb more than one acre must prepare and obtain BAAQMD approval for an asbestos dust mitigation plan. The plan must specify how the operation will minimize emissions and must address specific emission sources. Regardless of the size of the disturbance, activities must not result in dust emissions that are visible crossing the property line.

The project applicant would be required to consult with the BAAQMD’s Enforcement Division prior to disturbance of soils that may contain asbestos. Project adherence to this requirement ensures that asbestos-related impacts would be less-than-significant. The regulation is designed to employ the best available dust mitigation measures in order to reduce and control dust emissions. The regulation is designed to employ the best available dust mitigation measures in order to reduce and control dust emissions so that sensitive receptors are not exposed to unhealthy levels of this contaminant.

Mitigation Measure 5.2-2 - No mitigation would be required.

Impact 5.2-3  Greenhouse Gas Emissions

New residences would be an additional source of GHG emissions, primarily through consumption of energy for transportation and energy usage. The additional GHG emissions, however, would not exceed BAAQMD GHG significance thresholds. This would be a less-than-significant impact.

Carbon dioxide, the primary man-made greenhouse gas of concern, would be generated by the project primarily from mobile sources and energy usage. The project’s contribution of these emissions is speculative, since alternatively to the project, people would live and travel in other areas and may have a similar effect. Air quality impact assessments for projects have traditionally assumed that emissions associated with projects would be entirely new to the air basin. This is a widely accepted assumption, since projects could bring new housing into an air basin, resulting in increased vehicle travel and other activities that may not have occurred without the project.

The development of in-fill housing located in urban areas with close proximity to transportation is likely to result in the lowest rates of GHG emissions. Measures that reduce energy consumption and waste can be included in new development that would reduce emissions. These would include energy-efficient construction methods, inclusion of solar photovoltaic panels to produce energy, passive solar design, appropriate landscape and water recycling systems.

The proposed project would include 43 new homes ranging in maximum size from 5,000 square feet to 8,750 square feet that would not be located within walking or typical bicycling distance of services. Transit or bus service to the project site is limited. The proposed project, therefore, would likely generate a greater rate of motor vehicle emissions than new residential development adequately served by bus service or other transit. The house sizes are larger than typical new houses, and therefore, would require more materials and energy to construct and more energy to operate. Because the project would generate emissions at a greater rate than typical new residential housing in California, the impact to GHG emissions may be interpreted as significant. However, the County’s Green Building Residential Certification standards would apply to the project. These requirements are a point based
system that range from a Silver rating for homes between 2,501 and 4,000 square feet to a platinum rating for homes over 5,500 square feet. Points are assigned to different portions of home construction requiring a more intense use of Green Building practices for larger homes. New construction would be subject to the County’s Single Family Dwelling Energy Efficiency Ordinance. The purpose of the standard is to require new single family homes to exceed the State’s 2005 Building Energy Efficiency Standards by at least 15 percent. Homes larger than 4,500 square feet are required to verify an increasing degree of energy efficiency greater than 15 percent in order to achieve energy efficiency standards comparable to that of a smaller residential dwelling.

Carbon dioxide, the primary man-made greenhouse gas of concern, would be generated by the proposed project primarily from construction, mobile sources and energy usage. The California Air Pollution Control Officers Association (CAPCOA) has provided guidance for calculating project emissions. Emissions from area, mobile and electricity usage are recommended by CAPCOA. Construction, area and mobile source emissions were calculated using the URBEMIS2007 model. It should be noted that the URBEMIS2007 model is based on many generic defaults, such as construction activity, natural gas usage and trip generation and trip lengths. The model provides a reasonable, estimate of the potential GHG emissions associated with the project. In May 2010, BAAQMD released the BAAQMD Greenhouse Gas Model (BGM), which utilizes output from the URBEMIS2007 model to predict GHG emissions in terms of CO2e. This model was used along with URBEMIS2007 to predict project GHG emissions.

Project construction would involve temporary GHG emissions associated with equipment and vehicles used for vegetation removal, grading, and construction of the project as well as emissions associated with manufacturing materials used to construct the project. The URBEMIS2007 model was used to estimate the emissions associated with construction equipment and vehicle activity. However, there are no reliable methods to estimate construction-related emissions associated with the manufacturing of project materials. Construction phases would include site grading, trenching, paving, and building construction. Construction emissions would occur over a period of at least four years. Most of these emissions would occur prior to project operation (i.e., people occupying new homes). BAAQMD CEQA Guidelines do not include quantifiable thresholds for construction period GHG emissions. BAAQMD considers these types of emissions to be less-than-significant if best management practices are implemented.

Area source emissions in the form of natural gas combustion for heating (i.e., space and water) and cooking were computed. These emissions were calculated using the URBEMIS2007/BGM model with default assumptions for single-family residences.

The URBEMIS2007/BGM models were also used to estimate mobile source emissions from the project. This model is based on the CARB’s EMFAC2007 on-road mobile source emission factor model. The model includes EMFAC2007 emission factors for CO2. Default trip generation and trip lengths for single-family residences were used in the modeling. The BGM model post-processes the URBEMIS2007 output to provide adjustments for new Pavley regulations that increase fuel efficiency, the low carbon fuel standard, and U.S. EPA adjustments for emissions of non-CO2 GHGs.

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22 Marin County Building Certification Form, op. cit.


24 CEQA & Climate Change, California Air Pollution Control Officers Association, January 2008.
Indirect emissions are associated with the generation of electricity consumed by operation of the project. The BGM model provides estimates of electricity usage and the associated GHG emissions. For new homes, this study identified an annual usage rate of 8,114 kilowatts per single-family residence. The BGM model uses an electricity CO₂ emission rates applicable to California as a whole. The electricity provider would be PG&E, which has a certified 2006 emission rate of 456 pounds of CO₂ per each 1,000-kilowatt hours of electricity produced. It should be noted that the PG&E rate is about 52 percent of the statewide average emission rate for electricity production (used by BGM) and 35 percent of the national average.

Exhibit 5.2-1 shows the annual GHG emissions in tons per year. Emission calculations are contained in the Appendix.

### Exhibit 5.2-1
### Annual Operational CO₂ Emissions

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<th>Source Type</th>
<th>Basis for Calculation</th>
<th>Annual CO2e Emissions (in metric tons per year)</th>
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<td>Transportation</td>
<td>URBEMIS2007 mobiles sources and BGM</td>
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<td>Area Sources</td>
<td>Landscape and fireplace from URBEMIS2007/BGM</td>
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<td>Electricity Usage</td>
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<td><strong>Total</strong></td>
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<td><strong>868 metric tons per year</strong></td>
</tr>
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</table>


In June 2010 the BAAQMD adopted development guidelines that establish air quality thresholds for greenhouse gases. The thresholds that would be applicable to the proposed project are as follows:

- Compliance with a qualified climate action plan or qualified general plan; or
- Annual emissions of less than 1,100 metric tons of CO₂e; or
- Annual emissions less than 4.6 metric tons of CO₂e per capita (residences and employees).

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The project emissions of CO$_2$e reported in Exhibit 5.2-1 are below the BAAQMD thresholds. As a result, the project emissions would be less-than-significant. This project does include numerous measures to reduce indirect emissions from energy consumption. These types of measures would further GHG from the proposed project.

*Mitigation Measure 5.2-3* No mitigation would be required.
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5.3 NOISE
Noise is defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (i.e., frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is the amplitude of sound waves combined with the reception characteristics of the ear. Amplitude may be compared with the height of an ocean wave.

In addition to the concepts of pitch and loudness, several noise measurement scales are used to describe noise in a particular location. A *decibel* (dB) is a unit of measurement, which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. Therefore, an increase of ten decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its decibel level. Each ten decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. **Exhibit 5.3-1** defines technical terms.

There are several methods of characterizing sound. The most common method used in California is the *A-weighted sound level* or *dBA*. All sound levels discussed in this EIR utilize the A-weighting scale. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. **Exhibit 5.3-2** shows representative outdoor and indoor noise levels in units of dBA. Because sound levels can vary markedly over a short period, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called Leq. The most common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration.
### Exhibit 5.3-1
**Definitions of Acoustical Terms**

<table>
<thead>
<tr>
<th><strong>Term</strong></th>
<th><strong>Definitions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decibel, dB</strong></td>
<td>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. The reference pressure for air is 20.</td>
</tr>
<tr>
<td><strong>Sound Pressure Level</strong></td>
<td>Sound pressure is the sound force per unit area, usually expressed in micro Pascals (micro Newtons per square meter), where one Pascal is the pressure resulting from a force of one Newton exerted over an area of one square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.</td>
</tr>
<tr>
<td><strong>Frequency, Hz</strong></td>
<td>The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.</td>
</tr>
<tr>
<td><strong>A-Weighted Sound Level, dBA</strong></td>
<td>The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the 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.</td>
</tr>
<tr>
<td><strong>Equivalent Noise Level, Leq</strong></td>
<td>The average A-weighted noise level during the measurement period. The hourly Leq used for this report is denoted as dBA Leq[h].</td>
</tr>
<tr>
<td><strong>Community Noise Equivalent Level, CNEL</strong></td>
<td>The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 PM to 10:00 PM and after addition of 10 decibels to sound levels in the night between 10:00 PM and 7:00 AM.</td>
</tr>
<tr>
<td><strong>Day / Night Noise Level, Ldn</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>L01, L10, L50, L90</strong></td>
<td>The A-weighted noise levels that are exceeded 1, 10, 50, and 90 percent of the time during the measurement period.</td>
</tr>
<tr>
<td><strong>Ambient Noise Level</strong></td>
<td>The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.</td>
</tr>
<tr>
<td><strong>Intrusive</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>

Source: Illingworth & Rodkin
**Exhibit 5.3-2**  
**Typical Noise Levels in the Environment**

<table>
<thead>
<tr>
<th>Common Outdoor Noise Source</th>
<th>Noise Level (dBA)</th>
<th>Common Indoor Noise Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet fly-over at 300 meters</td>
<td>120 dBA</td>
<td>Rock concert</td>
</tr>
<tr>
<td>Pile driver at 20 meters</td>
<td>110 dBA</td>
<td>Night club with live music</td>
</tr>
<tr>
<td>Large truck pass by at 15 meters</td>
<td>100 dBA</td>
<td>Noisy restaurant</td>
</tr>
<tr>
<td>Gas lawn mower at 30 meters</td>
<td>90 dBA</td>
<td>Garbage disposal at 1 meter</td>
</tr>
<tr>
<td>Commercial/Urban area daytime</td>
<td>80 dBA</td>
<td>Vacuum cleaner at 3 meters</td>
</tr>
<tr>
<td>Suburban expressway at 90 meters</td>
<td>70 dBA</td>
<td>Normal speech at 1 meter</td>
</tr>
<tr>
<td>Suburban daytime</td>
<td>60 dBA</td>
<td>Active office environment</td>
</tr>
<tr>
<td>Urban area nighttime</td>
<td>50 dBA</td>
<td>Quiet office environment</td>
</tr>
<tr>
<td>Suburban nighttime</td>
<td>40 dBA</td>
<td></td>
</tr>
<tr>
<td>Quiet rural areas</td>
<td>30 dBA</td>
<td>Library</td>
</tr>
<tr>
<td>Wilderness area</td>
<td>20 dBA</td>
<td>Quiet bedroom at night</td>
</tr>
<tr>
<td>Threshold of human hearing</td>
<td>10 dBA</td>
<td>Quiet recording studio</td>
</tr>
<tr>
<td>Source: Illingworth &amp; Rodkin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within approximately plus or minus one dBA.
Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. With greater distances between the receptor and noise source it is more likely that additional variables, such as topography, wind, and other atmospheric conditions affect the transmission of noise. Close to the noise source, the models are accurate to within approximately plus or minus one to two dBA.

Since the sensitivity to noise increases during the evening and at night because excessive noise interferes with the ability to sleep, 24-hour descriptors were developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level, (CNEL) is a measure of the cumulative noise exposure in a community, with a five dB penalty added to evening (i.e., 7:00 PM - 10:00 PM) noise levels and a ten dB addition to nocturnal (10:00 PM - 7:00 AM) noise levels. The Day / Night Average Sound Level, Ldn, is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

SCOPING COMMENTS

Public scoping comments regarding the proposed project’s noise impacts were received by the County in February 2009. Concerns raised include noise generated during the construction process by construction vehicles and the operation of heavy equipment. Comments expressed a particular concern for the duration of time construction would occur.

REGULATORY FRAMEWORK

Marin County establishes goals and policies in the Noise section of the Built Environment Element of the Marin Countywide Plan (CWP). The following goals, policies, and implementing programs would apply to this project (also see Exhibit 4.0-2):

- **Goal NO-1** - Protection From Excessive Noise. Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.

- **Policy NO-1.1** - Limit Noise From New Development. Direct the siting, design, and insulation of new development to ensure that acceptable noise levels are not exceeded.

- **Policy NO-1.2** - Minimize Transportation Noise. Ensure that transportation activities do not generate noise beyond acceptable levels, including in open space, wilderness, wildlife habitat, and wetland areas.

- **Policy NO-1.3** - Regulate Noise-Generating Activities. Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.

Implementing programs

- **NO-1.a** - Enforce Allowable Noise Levels. Through CEQA and County discretionary review, require new development to comply with allowable noise levels.
The acceptable noise levels in Figure 3-41 (not included) shall be used as a guide for determining the appropriate type of new development in relation to its ambient noise environment. Figure 3-41 applies primarily to proposed development exposed to transportation-generated noise and to existing development exposed to increases in transportation-generated noise due to proposed development. The standards in Figure 3-41 shall also be used to determine allowable noise levels for commercial, industrial, agricultural or other less noise sensitive land uses exposed to stationary source noise generated by new development.

- **NO-1.b - Comply with Acceptable Noise Levels.** Require discretionary permits for residential and other noise sensitive land uses proposed near noise sources that may exceed acceptable noise levels and/or benchmarks to provide acoustical analyses and, if necessary, to commit measures to comply with the applicable standards set out in Program NO-1.a. Amend the Development Code to include these requirements.

- **NO-1.c - Require Project-Specific Noise Mitigation.** Require all development to mitigate its noise impacts where the project would:
  
  - Raise the $L_{dn}$ by more than 5 dBA; or
  - Raise the $L_{dn}$ by more than 3 dBA and exceed the Normally Acceptable standard; or
  - Raise the $L_{dn}$ by more than 3 dBA and the Normally Acceptable standard is already exceeded.

- **NO-1.d - Set Additional Limits for Housing.** Amend the Development Code to require the following maximum noise levels for all new residential units:
  
  - Exterior – 60 dBA $L_{dn}$; and
  - Interior – 45 dBA $L_{dn}$.

- **NO-1.e - Coordinate with Public Agencies.** Work with local, regional, State, and federal agencies to address existing and potential noise impacts, such as vehicle-tire sound production and aircraft overflights to determine appropriate mitigation measures necessary to meet Acceptable Noise Levels.

Allowable hours of construction are contained in the *Marin County Code. Section 6.70.030(5)* of the County Code states the following:

- Hours for construction activities and other work undertaken in connection with building, plumbing, electrical, and other permits issued by the Community Development Agency shall be limited to the following:

  - Monday – Friday: 7:00 AM to 6:00 PM
  - Saturday: 9:00 AM to 5:00 PM

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1 *Marin Countywide Plan*, Marin County Community Development Agency, adopted November 6, 2007, Figure 3-41 is located on page 3-177.

Loud noise-generation construction-related equipment (e.g., backhoes, generators, jackhammers) can be maintained, operated, or serviced at a construction site for permits administered by the Community Development Agency from 8:00 AM to 5:00 PM Monday to Friday only.

**EXISTING NOISE ENVIRONMENT**

The project site is located in a quiet residential setting. Single-family homes adjoin the site on the northwest, west, and south sides. Noise on the project site results from traffic on Paradise Drive, and jet and general aviation aircraft over-flights. Natural sounds contribute to the acoustical environment. Noise measurements were made at two locations to quantify the existing noise levels in the vicinity of the project site. The measurement locations are shown on Exhibit 5.3-3. Two long-term (LT-1 and LT-2) and two short-term (ST-1 and ST-2) noise measurements were conducted from the afternoon of April 1, 2009 to the afternoon of April 2, 2009.

Noise measurement LT-1 was located at the end of Ridge Road adjacent to the south side of the project site. The acoustical environment at LT-1 is very quiet, and resulted primarily from the occasional airplane and natural sounds such as birds and wind. Airplanes generated maximum noise levels of about 46 dBA $L_{max}$. The average noise level for each hour is shown in Exhibit 5.3-4. Hourly average noise levels at this location ranged from 38 to 53 dBA $L_{eq}$ during the daytime and 32 to 44 dBA $L_{eq}$ at night. The day / night average noise level at this location was 47 dBA $L_{dn}$.

Noise measurement LT-2 was located about 20 feet from the centerline of Paradise Drive. Traffic was the primary source of noise at this location. Vehicles passing by generated an instantaneous maximum noise level of up to 69 dBA $L_{max}$. The average noise level for each hour is shown in Exhibit 5.3-4. Hourly average noise levels at this location ranged from 46 to 57 dBA $L_{eq}$ during the daytime and 35 to 47 dBA $L_{eq}$ at night. The day / night average noise level at this location was 54 dBA $L_{dn}$.

Short-term noise measurements were made concurrently with long-term noise measurements at the same locations. During measurement ST-1, with the exception of one jet aircraft overflight, only natural sounds were heard, with levels varying between 31 to 34 dBA. The jet caused the noise level to increase to a maximum of 56 dBA. The average level was 38 dBA $L_{eq}$. During measurement ST-2, traffic on Paradise Drive caused noise levels to range from 63 to 69 dBA $L_{max}$. Birds and other natural sounds resulted in levels ranging from 35 to 40 dBA. The average level was 55 dBA $L_{eq}$. A summary of the noise data acquired at sites ST-1 and ST-2 is shown in Exhibit 5.3-5.
Exhibit 5.3-3
Noise Measurement Locations

Source: Illingworth & Rodkin, TerraMetrics 2009
Exhibit 5.3-4
Summary of Long Term Noise Data

Noise Level at LT-1
At the end of Ridge Road
April 1-2, 2009

Noise Level at LT-2
~ 20 feet from the centerline of Paradise Drive
April 1-2, 2009

Source: Illingworth & Rodkin 2009
### Exhibit 5.3-5
**Summary of Short Term Noise Data Measured April 1, 2009**

<table>
<thead>
<tr>
<th>Noise Measurement Location</th>
<th>Time</th>
<th>( L(1) ) (dBA)</th>
<th>( L(10) ) (dBA)</th>
<th>( L(50) ) (dBA)</th>
<th>( L(90) ) (dBA)</th>
<th>( L_{eq} ) (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST-1 – Same location as Site LT-1</td>
<td>5:00pm</td>
<td>47</td>
<td>42</td>
<td>34</td>
<td>31</td>
<td>38</td>
</tr>
<tr>
<td>ST-2 – Same location as Site LT-2</td>
<td>4:15pm</td>
<td>68</td>
<td>58</td>
<td>41</td>
<td>37</td>
<td>55</td>
</tr>
</tbody>
</table>

Source: Illingworth & Rodkin 2009
Noise – Significance Criteria

The noise analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review guidelines. Based on the State CEQA Guidelines the project would have a significant noise impact 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 or groundborne noise levels.

- Generate a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

- Generate a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Construction noise would be a significant impact if:

- The noise level would exceed 60 dBA Leq and the existing ambient level by at least 5 dBA Leq, and

- The noise would be generated regularly for a 12-month period or longer.

- 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, the project would expose people residing or working in the project area to excessive noise levels.

- For a project within the vicinity of a private airstrip, the project would expose people residing or working in the project area to excessive noise levels.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant noise impact if it would:

- Generate noise that would conflict with Countywide noise standards or other state local noise standards.

- Propose land uses that substantially increase noise levels in areas of sensitive receptors.

- Propose land uses that are not compatible with baseline noise levels.
Noise – Impacts and Mitigation Measures

**NO OR LESS-THAN-SIGNIFICANT IMPACTS**

Based on the findings of the analyses completed as a part of this Draft EIR it has been determined that the proposed *2008 Easton Point Residential Development* would have either no or less-than-significant impacts for the following significance criteria.

- *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.*
  
  The quiet setting is clearly compatible with the future land uses of the proposed residential development. There are no quantitative noise thresholds in the *CWP* that would be exceeded.

- *Expose persons to or generate excessive groundborne vibration or groundborne noise levels.*
  
  The project would not expose persons to or generate excessive groundborne vibration or groundborne noise levels. No impact would result.

- *Generate a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.*
  
  The noise generated from the proposed houses would be of the same character and level as current neighborhood noises. Traffic noise levels would not measurably increase (increase would be less than one dBA) on area roadways as a result of the proposed project. Noise sources on the project site would not generate a significant adverse impact on existing homes in the vicinity of the project. No impact would result.

- *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, the project would expose people residing or working in the project area to excessive noise levels.*
  
  Smith Ranch Airport and Marin County Airport (Gnoss Field) are the nearest airports to the project site. Smith Ranch Airport is located approximately eight miles to the north and Gnoss Field is located north of Novato about 17 miles from the site. The site is not covered by either airport’s land use plan. No existing or proposed public or public-use airports are located within two miles of the site and aircraft operations would not expose persons to excessive aircraft noise. Thus, the project would have no impact.

- *For a project within the vicinity of a private airstrip, the project would expose people residing or working in the project area to excessive noise levels.*
  
  The project site is not in the vicinity of the private airstrip. No impact would result.

- *Propose land uses that substantially increase noise levels in areas of sensitive receptors.*
The proposed residential use would be similar to existing uses in the vicinity of the project site. As stated above, traffic noise would not measurably increase and there are no other noise sources proposed that adversely increase noise levels.

- Propose land uses that are not compatible with baseline noise levels.

The proposed residential land uses would generate noise levels that are similar to the existing baseline.

**IMPACT ANALYSIS**

**Impact 5.3-1 Construction Noise**

Construction of the 2008 Easton Point Residential Project would temporarily increase ambient noise levels in the site vicinity. Given the potential for substantial increases in noise at nearby homes as a result of project construction and the likelihood that substantial noise increases would occur intermittently for more than one year, this would be a significant impact.

Noise impacts resulting from construction activities would depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Implementation and phasing of the proposed project is described in Chapter 3.0 Description of the Proposed Project.² The project applicant would construct road extensions and install infrastructure. Applicant implemented construction would occur in two phases:

- Phase One would include construction of Forest Glen Court and the realigned water line. The construction access road, retaining walls, and paving would occur in this phase. The new MMWD water tank would also be constructed.

- Phase Two would include the clearing, grubbing, grading, landslide repair, subdivision road extensions, utility placement (including installation of pipelines, drop inlets, fire hydrants, electric and cable utility infrastructure) for lots adjacent to the Hill Haven neighborhood. Drainage and utility extensions would also be constructed in this phase.

Individual house construction would occur after completion of the roads, utilities, other infrastructure and other activities in Phases One and Two. Lots 20 and/or 24 would be the last developed with housing so that either or both of these lots may be used as staging/storing areas for cut and fill materials associated with development of all other upper lots.

Construction of Phase One would take approximately 12 months (see Exhibit 3.0-12). On-site construction equipment would include one dozer (D-8), one excavator (E-330), a blade grader, one small compactor, and one water truck.³ Construction of Phase Two would take approximately 12 months. On-site construction equipment would be the same as Phase One.⁴ These types of

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² Exhibit 3.0-12 summarizes the approximate duration of individual construction activities and the estimated number of construction workers on-site during each activity.


⁴ Ibid.
equipment generate considerable noise, and it is anticipated that most of the equipment would be brought to the site at the beginning of the site work and left there until the completion of the construction.

The construction access road would be the primary access to the site for construction vehicles, including earthmoving, construction materials, and work crews of all construction activities on the project site, including residential home construction. Individual lot owners when contracting for construction of a specific lot would be required to include in the construction contract a requirement that all construction access be from the construction access road.  

Construction truck traffic would access the project site via Paradise Drive. Lots 21, 22, and 23 would be accessed directly from Paradise Drive; the rest of the project site would be accessed via Forest Glen Court and the construction access road. Lots 1, 2, and 3 would be accessed via the construction access road and then via Ridge Road and Mountain View Drive.

The highest construction noise levels would be generated during earthmoving activities with lower noise levels occurring during building framing and finishing. Exhibits 5.3-6 and 5.3-7 describe typical A-weighted average and instantaneous equivalent noise levels expected during various project construction activities. Earthmoving activities could last for the duration of three months for Phase One and four months for Phase Two, and would include grading and infrastructure improvements where heavy equipment would be used.

The hourly average noise level shown in Exhibit 5.3-6 are based on the noise levels for typical equipment shown in Exhibit 5.3-7, and the numbers and types of pieces of equipment typically associated with the various levels of activity. The hourly average noise levels also reflect normal hourly variations in duty cycles (equipment operating at high, low, or medium power) and usage factors (numbers of hours equipment typically operates).

Large pieces of earthmoving equipment such as graders, scrapers, and bulldozers typically generate maximum noise levels of 80 to 85 dBA at a distance of 100 feet. Maximum hourly average construction generate noise levels of about 81 dBA to 88 dBA measured at a distance of 50 feet from the activity center could intermittently occur during busy construction periods. Construction-related noise levels are normally five to ten dBA less during building framing, finishing, and landscaping phases. There would be variations in construction noise levels on a day-to-day basis depending on the actual activities occurring at the site. These reference noise levels are reduced with distance and the effects of intervening topography. These factors are taken into account in the calculation of construction noise levels that would be received at existing homes in the area. The noise levels drop off at a rate of about six dBA per doubling of distance between the noise source and receptor. Shielding by buildings would provide an additional five to ten decibels of attenuation at distant receptors.

Noise resulting from trucks on the construction access road was included in the analysis of construction noise. Noise from individual vehicles is quantified in the United States using the National Reference Energy Mean Emission Levels. For heavy trucks operating in interrupted flow or on steep grades the range of maximum noise levels is 81 to 88 dBA measured at a distance of 50 feet.  

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5 Draft Declaration of Conditions, Covenants and Restrictions for Easton Point, op. cit.

6 Handbook of Noise and Vibration Control, Malcolm Crocker, Editor, 2007, page 1433, Figure 7.
Exhibit 5.3-6
Typical Ranges of Energy Equivalent Noise Levels at 50 Feet From Construction Sites
($L_{eq}$ in dBA)

<table>
<thead>
<tr>
<th></th>
<th>Domestic Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Clearing</td>
<td>83</td>
</tr>
<tr>
<td>Excavation</td>
<td>88</td>
</tr>
<tr>
<td>Foundations</td>
<td>81</td>
</tr>
<tr>
<td>Erection</td>
<td>81</td>
</tr>
<tr>
<td>Finishing</td>
<td>88</td>
</tr>
</tbody>
</table>


Exhibit 5.3-7
Construction Equipment 50-Foot Noise Emission Levels

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>$L_{max}$ Level (dBA)$^{1,2}$</th>
<th>Impact/Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arc Welder</td>
<td>73</td>
<td>Continuous</td>
</tr>
<tr>
<td>Auger Drill Rig</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Backhoe</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Bar Bender</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Boring Jack Power Unit</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Chain Saw</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Compressor$^3$</td>
<td>70</td>
<td>Continuous</td>
</tr>
<tr>
<td>Compressor (other)</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Concrete Mixer</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Concrete Pump</td>
<td>82</td>
<td>Continuous</td>
</tr>
<tr>
<td>Concrete Saw</td>
<td>90</td>
<td>Continuous</td>
</tr>
<tr>
<td>Concrete Vibrator</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Crane</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Dozer</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Excavator</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Front End Loader</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Generator</td>
<td>82</td>
<td>Continuous</td>
</tr>
<tr>
<td>Generator (25 KVA or less)</td>
<td>70</td>
<td>Continuous</td>
</tr>
<tr>
<td>Gradall</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Grader</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Grinder Saw</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Horizontal Boring Hydro Jack</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Hydra Break Ram</td>
<td>90</td>
<td>Impact</td>
</tr>
<tr>
<td>Impact Pile Driver</td>
<td>105</td>
<td>Impact</td>
</tr>
<tr>
<td>Insitu Soil Sampling Rig</td>
<td>84</td>
<td>Continuous</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>85</td>
<td>Impact</td>
</tr>
<tr>
<td>Mounted Impact Hammer (hoe ram)</td>
<td>90</td>
<td>Impact</td>
</tr>
<tr>
<td>Paver</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Pneumatic Tools</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Pumps</td>
<td>77</td>
<td>Continuous</td>
</tr>
<tr>
<td>Rock Drill</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Scraper</td>
<td>85</td>
<td>Continuous</td>
</tr>
</tbody>
</table>
5.3 Noise

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>$L_{max}$ Level (dBA)$^{1,2}$</th>
<th>Impact/Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slurry Trenching Machine</td>
<td>82</td>
<td>Continuous</td>
</tr>
<tr>
<td>Soil Mix Drill Rig</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Street Sweeper</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Tractor</td>
<td>84</td>
<td>Continuous</td>
</tr>
<tr>
<td>Truck (dump, delivery)</td>
<td>84</td>
<td>Continuous</td>
</tr>
<tr>
<td>Vacuum Excavator Truck (vac-truck)</td>
<td>85</td>
<td>Continuous</td>
</tr>
<tr>
<td>Vibratory Compactor</td>
<td>80</td>
<td>Continuous</td>
</tr>
<tr>
<td>Vibratory Pile Driver</td>
<td>95</td>
<td>Continuous</td>
</tr>
<tr>
<td>All other equipment with engines larger than 5 HP</td>
<td>85</td>
<td>Continuous</td>
</tr>
</tbody>
</table>

Notes:
1 - Measured at 50 feet from the construction equipment, with a “slow” (1 sec.) time constant.
2 - Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.
3 - Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

Source: National Cooperative Highway Research Program (NCHRP), Mitigation of Nighttime Construction Noise, Vibrations and Other Nuisances, 1999.

of noise levels generated by other pieces of heavy construction equipment operating under load and were accounted for in the analysis.

As a part of the Precise Development Plan a Construction Management Plan $^7$ has been prepared. Noise control measures included in the Construction Management Plan include the following:

- Muffle and maintain all equipment used on site. All internal combustion engine-driven equipment shall be fitted with mufflers which are in good condition. Good mufflers shall result in non-impact tools generating a maximum noise level of 80 dBA when measured at a distance of 50 feet.

- Schedule construction activities to have the least impact on noise-sensitive receptors (existing residents) in the area. This shall be accomplished by limiting construction activities, including grading, excavating, and paving, to weekdays between 7:30 AM and 5:30 PM. Allowable construction hours shall be posted clearly on a sign at each construction site.

- Designate a Disturbance Coordinator for the duration of applicant-implemented construction, and also incorporate in the Covenants Conditions and Restrictions document (CC&R’s) the responsibility of the Property Owners’ Association to designate a Disturbance Coordinator for the duration of lot-owner construction until full buildout. The Disturbance Coordinator shall:
  - Receive and act on complaints about construction disturbances during infrastructure installation, landslide repair, road building, residential construction, and other construction activities.
  - Determine the cause(s) and implement remedial measures as necessary to alleviate significant problems.

Clearly post his / her name and phone number(s) on a sign at each construction site.

The topography of the project site would result in fairly complex exposure to construction noise for existing homes surrounding the site. Where homes have a direct view of construction activities, noise levels would increase due to construction activities. The northernmost existing homes along Ridge Road are located adjacent to Lots 4 and 5, and the northernmost existing homes along Mountain View Drive are located adjacent to Lot 3. Hourly average noise levels at receptors located 50 to 250 feet from busy construction activity would be as high as 74 to 88 dBA $L_{eq}$. Existing houses on Mountain View Drive and Ridge Road located further away from construction activities would experience lower noise levels. Existing houses along Straits View Drive are located 1,300 feet or more from proposed residential use areas on Lots 16, 17, and 18. It is estimated that hourly average noise levels at receptors located along Straits View Drive would be 60 dBA $L_{eq}$ or less.

An existing house southwest of the project site, accessed from Spanish Trail Road, is located approximately 400 feet from Lot 21. Hourly average noise levels at receptors located 400 feet from busy construction activity would be as high as 70 dBA $L_{eq}$. The next nearest proposed residential lot is Lot 22, located approximately 850 feet from this home. Hourly average noise levels 850 feet from busy construction activity would be as high as 63 dBA $L_{eq}$ at this existing house.

The Chapman residence at 2641 Paradise Drive is located approximately 300 feet north of the building site of Lot 23. Hourly average noise levels at receptors located 300 feet from busy construction activity would be as high as 72 dBA $L_{eq}$. The next nearest proposed residential lot is Lot 22, located approximately 500 feet from this home. Hourly average noise levels 500 feet from busy construction activity would be as high as 68 dBA $L_{eq}$ at this existing house.

Several existing homes are located south of Lots 27 through 30, approximately 400 to 700 feet from the proposed building sites of these lots. Hourly average noise levels at homes located 400 to 700 feet from busy construction activity would range from 65 to 70 dBA. Existing homes along Paradise Drive located further than 700 feet from busy construction activities would experience lower noise levels.

As noted above, construction truck traffic would access the project site via Paradise Drive. The construction truck traffic would utilize the construction access road throughout all phases of construction of infrastructure and the buildout of residential lots. Lots 1, 2, and 3 would be accessed via Ridge Road and Mountain View Drive from the Ridge Road site access point. The construction access road would, therefore, handle most of the construction truck traffic and, thereby, minimize construction truck traffic through existing residential neighborhoods.

The amount of construction truck traffic would vary on a day-to-day basis depending on the construction activities occurring at any given time. For example, more construction truck traffic would result during the road paving phase of the project, as opposed to the planting and cleanup phase of project where substantially fewer trips would be required. The noise from individual trucks would be clearly audible and would temporarily elevate noise levels along roadways serving the site as each truck passes.

During the site preparation and grading phases of the project, construction trucks would be required to import and export fill as well as to import materials such as precast blocks, concrete, lumber, and rebar for use in constructing retaining walls. Construction trucks would also be necessary when utilities are installed to import concrete for the water tank construction, and other materials necessary to complete

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8 Ibid, page 3.
the proposed pipelines and drainage improvements. During the road paving phase of the project, it is anticipated that approximately 700 trucks would be required to import base rock and concrete to the site.\(^9\) Construction truck traffic would be expected to substantially lower during the planting and cleanup phase of project. Construction truck traffic expected during individual home construction would be even less, averaging only a few truck trips per day.

The road paving phase of the project would yield the highest number of trucks per day. Assuming Phases 1 and 2 would each require 350 trucks (700 one-way truck trips) in approximately 20 workdays, it is anticipated that there would be approximately 35 one-way truck trips on a daily basis. On average over the course of an eight-hour workday, there would be five one-way truck trips in any given hour. The hourly average noise level resulting from these five one-way truck trips is calculated to be 56 dBA \(L_{eq}\) assuming a travel speed of 25 mph. The day-night average noise level on the worst truck traffic days would be approximately 52 dBA \(L_{dn}\) at a distance of 50 feet from the roadway center. Construction truck traffic on the busiest days could result in substantial increases in ambient noise levels along portions of Paradise Drive where ambient traffic noise levels are generally low (near Site LT-2). On portions of Paradise Drive where traffic volumes are generally higher, construction truck traffic would cause no substantial change in daily average or annual average noise levels.

Throughout other aspects of the project, truck traffic would be much more infrequent. It is estimated that site development (access, utility installation, and landslide stabilization) would generate a “surplus” of 6,499 cubic yards of cut.\(^10\) Assuming 20 cubic yard trucks, this would equate to 325 truck trips. However, it is proposed to store some of the cut material on site (2,863 cubic yards) to be used for the fill necessary for house construction, resulting in 3,636 cubic yards to be taken off-site. Approximately 182 trucks would be required to remove this material assuming that each truck would remove 20 cubic yards of material at a time. Each truck would generate two trips and would equate to 182 truck trips per construction phase. The grading portion of Phase One is expected to last three months and the grading in Phase Two is anticipated to last four months. Assuming 20 workdays per month, the removal of the “surplus” cut material would require one to two trucks per day (two to four truck trips per day). These infrequent truck trips would not substantially increase ambient traffic noise levels along Paradise Drive.

The proposed 180,000-gallon water tank would be constructed as part of Phase One. The water tank is proposed about 300 feet north of Lot 39 adjacent to the westernmost boundary of the site. The water tank would be over 800 feet from the nearest existing homes to the west and south. Water tank construction activities would generate hourly average noise levels of approximately 87 dBA \(L_{eq}\) at a distance of 50 feet. At the nearest receivers 800 feet from the water tank construction site, construction activities would be expected result in hourly average noise levels of approximately 63 dBA \(L_{eq}\). Water tank construction activities are calculated to generate noise levels greater than 60 dBA \(L_{eq}\) at receptors located within about 1,100 feet.

The project also proposes construction of an approximate 4,800-foot long, four inch diameter sanitary sewer force main in Paradise Drive from Forest Glen Court to approximately 800 feet south of the southernmost project boundary. Construction noise would primarily consist of the operation of vehicles and equipment during pavement removal, excavation, pipeline installation, backfill operations, and the repaving of the portion of the street disturbed by the project. The installation of

\(^9\) Ibid.

\(^10\) Easton Point – Project Narrative, project applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009, page 27.
pipelines would result in average noise levels of approximately 86 dBA $L_{eq}$ at a distance of 50 feet. Maximum instantaneous noise levels during this phase would reach 89 dBA $L_{max}$ at a distance of 50 feet assuming that a jack hammer would be required to remove the existing pavement. Pipeline construction activities are calculated to generate noise levels greater than 60 dBA $L_{eq}$ at receptors located within about 1,000 feet of the proposed pipeline alignment.

Construction noise levels would be substantially above the existing measured ambient noise level at existing houses in the vicinity of the project. Noise-sensitive receptors located within approximately 1,300 feet of busy construction activity could potentially experience noise levels of about 60 dBA at times. The increase would be less where terrain shielding occurs. Existing homes located west and northwest of the project site would experience hourly average noise levels of less than 60 dBA $L_{eq}$ during busy construction activities at any of the 43 proposed residential units. Levels of 60 dBA would be about ten dBA above the existing levels at some locations that were measured at or near the project site. Noise levels exceeding 60 dBA $L_{eq}$ could be received at nearby homes during earthmoving operations, the construction of foundations, building framing, and finishing.

Project development would expose existing residents, primarily those near the ridgeline, to construction-generated noise. Construction activities to prepare the site and install infrastructure would increase noise levels over a two-year period. Building individual houses would generate noise that would be audible for nearby houses. The duration of building these houses could take from three to ten years. Given the potential for substantial increases in noise at adjacent houses as a result of project construction and the likelihood that substantial noise increases would occur for more than one construction season, the construction project would result in a significant noise impact.

**Mitigation Measure 5.3-1** The applicant shall mitigate construction noise impacts by implementing the Construction Management Plan (including planned mitigation of construction traffic impacts) as set forth in the Precise Development Plan and as modified as follows:

- Modify the construction hours to be consistent with Section 6.70.030(5) of the Marin County Code. Construction hours shall be:
  - Hours for construction activities and other work undertaken in connection with building, plumbing, electrical, and other permits issued by the Community Development Agency shall be limited to the following:
    - Monday – Friday: 7:00 AM to 6:00 PM
    - Saturday: 9:00 AM to 5:00 PM
    - Loud noise-generation construction-related equipment (e.g., backhoes, generators, jackhammers) can be maintained, operated, or serviced at a construction site for permits administered by the Community Development Agency from 8:00 AM to 5:00 PM Monday to Friday only.
- Utilize “quiet” models of air compressors and other stationary noise sources where technology exists.
• Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.

• Prohibit unnecessary idling of internal combustion engines.

• Prohibit audible construction workers’ radios on adjoining properties.

• Notify neighbors of the construction schedule prior to the beginning of each phase that would generate substantial noise (i.e., five dBA or more above ambient levels and exceeding 60 dBA $L_{eq}$).

**Significance after Mitigation** Implementation of the above mitigation measure would reduce the effects of construction noise upon existing homes in the area. Even after implementing these measures, however, noise levels at adjacent homes would continue to substantially exceed existing ambient noise levels. Because construction is expected to last more than one year, and even after implementing these measures noise levels would substantially exceed ambient levels, this would be a significant unavoidable impact.

**Responsibility and Monitoring** Marin County staff would be responsible for ensuring that the Construction Management Plan is modified as described in Mitigation Measure 5.3-1. The applicant shall be responsible for ensuring that the neighbors are notified of the construction schedule prior to the beginning of each phase that would generate substantial noise (i.e., five dBA or more above ambient levels and exceeding 60 dBA $L_{eq}$).
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5.4 GEOLOGY AND SOILS
Geology and Soils – Environmental Setting

PREVIOUS GEOLOGIC WORK

Geologic conditions are complex and vary significantly across the Easton Point site. A number of geologists have mapped and studied the Tiburon area in various levels of detail. General geologic mapping of the region has been compiled and shown by Blake and others in 1974 and by Blake, Graymer and Jones in 2000. Several other published reports and maps cover the vicinity of the site. Ellen, Peterson, and Reid mapped Marin and Sonoma Counties for the U.S. Geological Survey (USGS) in 1975, as did C.M. Wentworth and V.A. Frizell who mapped landslides in parts of Marin and Sonoma Counties for the USGS in 1975. C.W. Davenport mapped eastern Marin County for the California Division of Mines and Geology (CDMG) in 1984. These maps detail the general geologic terrain, slope stability, and landsliding of the region.

Geology for Planning Central and Southeastern Marin County, California describes the stability, seismicity, and geologic units for the region. The Soil Survey of Marin County, California is a comprehensive study of the region's surficial soils, classifications and properties, and land use management.

Extensive detailed site-specific geotechnical investigations also have been performed on the Easton Point project site. This work was performed for the applicant by Harding Lawson Associates (HLA)


in 1986 and 1988,\textsuperscript{8} by Kleinfelder, Inc., in 1992, 1994, 1995, 1996, 1997, and 1999,\textsuperscript{9} and by Miller-Pacific, Inc., in 2008. Their work was focused on understanding site geology for development. HLA’s work included preliminary reconnaissance geologic mapping of the site in 1986 and a subsurface geotechnical exploration in 1988 which focused on potential landslide hazards in the central part of the site.\textsuperscript{10} Six exploratory borings were drilled and 32 backhoe pits were excavated for the second report.

Kleinfelder reviewed HLA's work in 1992, prepared a landslide assessment report in 1994, and conducted a subsurface exploration of the site in 1993 (released in draft form at that time and ultimately released in April, 1995).\textsuperscript{11} Exploration included the drilling of two borings and excavation of 46 test pits.

In 1994, the Miller Pacific Engineering Group reviewed the previous HLA and Kleinfelder reports for the Town of Tiburon. Based on the information provided for review by the applicant, Miller Pacific concluded that, for the Town’s purpose of accepting an application as complete for environmental review, the “evaluation made and the repair method selected is appropriate and meets the intent of the Town's criteria” for the landslides identified to that point in time. The letter goes on to say that\textsuperscript{12}

> “It should be noted that the repair methods are at this time schematic; that is, they indicate the general way in which the repair is to be made. ... When planning approvals have been obtained, detailed investigation will be needed in many of the landslide areas, and detailed designs developed for construction.”

The Miller Pacific evaluation was performed to determine whether the application was complete for Town review of a Precise Development Plan (PDP) proposed at that time. Subsequent to the evaluation, a peer review of the HLA and Kleinfelder reports also was conducted for the Town of Tiburon by the geologists, Rogers / Pacific, Inc.\textsuperscript{13} The EIR geologists performed additional field reconnaissance and geomorphic landslide mapping for the Town. This work was conducted to independently review the site's geologic conditions and verify the mapped extent of potential geologic hazards (such as landslides). While the interpretations resulting from Rogers / Pacific's geologic review generally concurred with the previous work by the applicant's geologists, Rogers / Pacific’s geologists identified two features on the site not previously mapped by the applicant's geologists. These two features potentially represented ancient bedrock landslides which had long been dormant. For the purposes of investigation and analysis, these features were designated as Landslide Features A and B. Landslide Feature A (now designated Landslide 11), the more significant of the possible ancient slides identified, is a large bedrock lobe located east of the Lands of Keil inholding. (These features are discussed in more detail in the Geomorphology and Landsliding and Impacts and


\textsuperscript{10} Ibid.

\textsuperscript{11} Ibid.

\textsuperscript{12} Geologic and Geotechnical Review, Easton Point Development (April 1992), op. cit.

\textsuperscript{13} Letter to Scott Anderson, Town of Tiburon, from Gene Miller, Miller Pacific Engineering Group, July 18, 1994.

\textsuperscript{14} The EIR geologists, David Snyder and Sean Wilson of Snyder & Wilson Engineering were the individuals who conducted the work for Rogers / Pacific and Snyder & Smith Associates that is described in this section.
Mitigation Measures subsections, below.) This large possible landslide also had been mapped previously by Rice, Smith, and Strand. Landslide Feature B, the second potential area of bedrock landslide, would have included parts of what are now proposed Lots 26 through 28.

The EIR geologists recommended that additional field investigation was necessary to determine whether either of these features were ancient landslides and to allow an evaluation of the feasibility of repair, if deemed necessary. A scope of investigation was developed by the EIR and applicant’s geologic consultants. Kleinfelder performed the field work in September and December of 1996 which consisted of the excavation and logging of three exploratory trenches for a total of 765 linear feet and the drilling of five continuous core borings. The results of the exploration indicated that Landslide Feature A, (current designation Landslide 11), did represent a large bedrock landslide and that Landslide Feature B probably did not. Landslide Feature B was reclassified and mapped primarily as in-place bedrock, with landslides 18 and 40 located along the feature’s east and west edges.

The slope stability of Landslide Feature A was then evaluated by Kleinfelder and reviewed by the EIR geologist and geotechnical engineer.

Since 2008, Miller Pacific’s role has evolved from agency reviewer for the Town of Tiburon, to that of the geotechnical engineer for the applicant on this project. The locations of the boring and trench logs for the aforementioned Kleinfelder work are shown on the Miller Pacific’s GR-1.

Personnel from Snyder & Wilson Engineering, (formally Snyder & Smith Associates and Rogers/Pacific) (the past and current EIR geologists), performed several site visits for reconnaissance mapping and were on-site for about one to two weeks during their peer review of Kleinfelder’s work in 1996. Additionally, the EIR geologists were present on-site for several follow-up site visits in 2000 and 2001 during the preparation of the 2001 Draft EIR for the Town of Tiburon. These site visits were supplemented by detailed air photo analysis and a review of the data obtained by Kleinfelder.

Public scoping comments for the proposed project regarding impacts to the site’s geology and soils were received by the County in February 2009. Concerns raised include the stability of existing landslides located at the project site; grading impacts on the hillside for roads, retaining walls, and building footprints, with an emphasis on the management of excess excavated materials; and the

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14 Geology for Planning Central and Southeastern Marin County, California, op. cit.
15 Recommended Scope of Landslide Inventory of Easton Point EIR, Tiburon, CA, Rogers / Pacific, August 1996, and Review of Proposed Scope of Landslide Inventory for the Easton Point EIR, Tiburon, CA, Rogers / Pacific, August 1996.
16 Scope of Investigation Possible Ancient Landslides, Easton Point, Tiburon, CA, Kleinfelder, Inc., August 1996.
17 Memorandum, Engineering Geology Peer Review Supplemental Exploration Landslide A and B at Easton Point, Tiburon, CA, Rogers / Pacific, September 1996, and Landslide Inventory, Lots 32 / 33 and Lots 36 / 37, Easton Point Development, Tiburon, CA, Kleinfelder, Inc., October 1996. (Note that the lot numbers refer to a prior project, not the PDP assessed in this EIR.)
21 Ibid.
secondary impacts site grading could have on biological resources and water quality, which are addressed in the appropriate topical analysis section. Additional concerns addressed include seismic safety in the event of an earthquake.

**GEOLOGY, SOILS, AND SEISMICITY SETTING**

The 110-acre project site is located at the eastern tip of the Tiburon Peninsula and is bounded by Paradise Drive (north and east), the existing Hill Haven and Old Tiburon neighborhoods (south), and a natural bedrock ridgeline (west). The site is shown on the USGS San Quentin Quadrangle.

**Topography**

Maximum relief on the site is about 500 feet and ranges from Paradise Drive to Tiburon Ridge at the western site boundary. For descriptive purposes, Snyder & Wilson Engineering (the EIR geologists) prepared a ridgeline map with the primary topographic ridges labeled A through J (see Exhibit 4.0-1). Of these ten topographic highs, ridges A, D, E, G, H, and I generally trend east-west, with ridges B, C, F, and J trending north-south. The ridges are relatively steep, and their topography is controlled by the underlying bedrock materials. The main ridges run through the north central and southern parts of the site and intersect offsite (where ridgelines C and G connect), in the adjacent Marin County Open Space.

Ridgetop elevations of the southern ridges range from 100 feet above sea level along Paradise Drive to 550 feet near the western site boundary (Ridgeline C). Ridgetop elevations of the northern ridgelines (Ridgelines G through J) are similar and range from about 100 feet (also along Paradise Drive) to 600 feet to the west. The steepest slopes on the site are generally located on the sides of these two ridge belts (ridgelines A through F and G through J).

The two east-west trending ridges and the north-south trending Ridgeline C frame a large amphitheater or bowl-shaped valley characterized by hummocky moderately sloping topography which appears to be controlled primarily by colluvium and landslide accumulation. This valley includes the Lands of Keil inholding 22 and descends off-site to Keil Cove. Most of this area lies within the area of the landslide 11.

The gentlest slopes are located primarily in the southwest corner of the site along the ridgeline and on the slope which descends to Mountain View Drive and Ridge Road in the adjacent Hill Haven neighborhood.

**Regional Geology**

Published geologic maps indicate the Tiburon Peninsula is primarily underlain by bedrock of the Franciscan Assemblage. 23 The *Soil Survey of Marin County, California* describes the Franciscan Formation (Assemblage) as consisting of “sandstone, graywacke, dark-colored or black shale, rhythmically interbedded radiolarian red chert and shale, some volcanic rock, and greenstone”. 24

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22  This 0.51-acre parcel is surrounded by the project site and contains a spring (see 3.1 Site Location and Land Uses).

23  *Geology of the Upper Ross Valley Western Portion of the San Rafael Quadrangle, Marin County, California*, T.C. Smith, 1976.

24  *Soil Survey of Marin County, California*, op. cit.
In this area, the Franciscan Assemblage is essentially an ancient fault zone of Jurassic-age bedrock which has been broken and sheared by tectonic forces, as the continental crustal plate overrode the thinner subducting Pacific plate. The result is a disrupted mass of hard rock types embedded in a fine-grained matrix which has been sheared and crushed. This assemblage or “mélange” unit is found throughout Marin County and much of the rest of the San Francisco Bay Area.

In this formation, the comparatively low strength of the fine-grained matrix generally exerts a noticeable effect on slope stability and is a major influence on landsliding. Varying slope stabilities throughout the region result from differential inherent strengths of the various components of the assemblage. Geology for Planning Central and Southwest Marin County states that:

“The mélange matrix weathers to clay-rich, highly expansive soils which swell upon wetting and shrink upon drying. As a result, downslope creep occurs by the alternating seasonal wetting and drying.”

Therefore, this mélange presents inherent problems both in slope stability and with the shrink-swell process of expansive soils.

Another feature of the Franciscan Assemblage is the common presence of springs. The springs essentially are open fractures in large rock masses located near the crests of ridges. Since they are open, they can collect and hold rainwater in their rather impermeable membranes formed by the matrix. As a result, springs commonly are found at or near ridgelines in Marin County. In addition, the landscape of Marin County often is strewn with odd outcrops of resistant rock described as “monument-like masses of hard rock projecting out of otherwise smooth grassy slopes”. These outcrops consist of a variety of rock types (such as sandstone, greenstone, serpentine, chert, and schist).

Uncommon mineralogy and unique rock associations are found in metamorphic rocks comprising the Franciscan Assemblage in the northern part of the Tiburon Peninsula. The Ring Mountain area is designated a Scientific Resource Zone. The minerals (lawsonite, garnet) and rock assemblages (glaucophane schist facies, eclogite facies) indicate metamorphism, which occurred at high pressure and low temperature geologic conditions. Indications of high pressure, low temperature metamorphism of the northern part of the Tiburon Peninsula are similar in the southeast part of the peninsula. However, the uncommon mineralogy and unique rock associations are less abundant in areas other than in the Ring Mountain area.

**Site Geology**

Previously published maps indicate that the project site primarily is underlain by unnamed and undifferentiated semi-schist, phyllite, and schist bedrock of Jurassic to Cretaceous age and, in the southwest corner, by Jurassic-aged serpentine of the Franciscan Assemblage. Site-specific mapping

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25 Geology for Planning Central and Southwest Marin County, California, op. cit.

26 Ibid.

27 Ibid.

28 "Late Cenozoic History of the Coast Ranges East of San Francisco Bay" (unpublished Ph.D. dissertation, University of California, Berkeley), J. R. Wagner, 1978, Areas Susceptible to Landsliding, Marin and Sonoma Counties, California, op. cit., and Geology for Planning Central and Southeastern Marin County, California, op. cit.
by HLA 29 and Kleinfelder 30 and regional mapping 31 indicate that the bedrock on-site generally can be divided into three east-west trending bands. These bands were in fault contact millions of years ago, but now the faults are inactive due to the changes in the structural geologic stress regime.

The northernmost band is composed of metasedimentary rocks which primarily are semi-schist and phyllite derived from sandstone and, to a lesser extent, other sedimentary rocks (such as shales) and pyroclastics of volcanic origin. While these rocks generally have a moderate to high strength for fresh rock, they often become highly weathered, after a few years of exposure and form clayey soils which are relatively unstable on slopes. Geology for Planning Central and Southeastern Marin County shows Zones 3 and 4 -- the least stable categories on its stability table -- on the part of the site with this type of bedrock. 32 These deposits are described as follows:

**Zone 3** Steepness of the slopes approaches the stability limits of the bedrock materials.

**Zone 4** Includes most landslide deposits in upslope areas, whether presently active or not, and slopes on which there is substantial evidence of downslope creep of surface materials. These areas should be considered naturally unstable and subject to potential failure, even in the absence of man-made activities.

This is evident at the project site where most of landslides are present in weathered bedrock or soils derived from this weak metasedimentary bedrock.

The central band of bedrock exposed at the site has been mapped as a mixture of the metasedimentary rocks and metavolcanic rocks (particularly near the western site boundary) which are primarily derived from metamorphosed basalt. The metavolcanic rock often exhibit steep slopes, as is indicated by the western ridgeline which exposes these materials.

Previously published maps indicate that the site is primarily underlain by unnamed and undifferentiated semi-schist, phyllite, schist bedrock of Jurassic to Cretaceous age and by Jurassic-aged serpentine of the Franciscan Assemblage. The serpentine generally consists of sheared rock material enclosing hard, unshered ellipsoidal and spheroidal serpentinite masses up to a few feet long. This unit is present along the southwest site boundary and has been mapped as being in fault contact with undifferentiated Franciscan rocks. This contact has been mapped by the applicant’s geotechnical consultant, as being a vertical, ancient and inactive fault.

While most of the geologic structure on the Tiburon Peninsula is faulted and folded into a series of thrust belts, the faults depicted on the site geologic map (see Exhibit 5.4-1) are shown as being vertical. This geomorphology can be explained in that the surface trace of flat or low angle faults parallels the topography. Conversely, vertical faults form a straight line that cuts across topography. A brief summary of the relationship between the mapped location of the serpentine and these proposed development areas follows.

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29 Preliminary Geologic Evaluation, Martha Company Holdings, Tiburon, California, op. cit., and Landslide Investigation Portions of Martha Company Property, Tiburon, California, op. cit.

30 Geologic and Geotechnical Review, Easton Point Development, Tiburon, California, op. cit., and Land Assessment and Mitigation: Easton Point, Tiburon, op. cit.

31 Geology for Planning Central and Southeastern Marin County, California, op. cit.

32 Ibid.
As mapped, the serpentine material may underlie proposed Lots 1 through 8, 17 through 20, and 24. The serpentine also encroaches into access driveways for many of these lots, Ridge Road, Mt. Tiburon Road and parcels A and B. Slope improvements along the boundary with Old St. Hilary’s Open Space Preserve could also expose serpentine in the proposed subdrain trenches and discharge/rip rap areas of Lot 8. The serpentine slightly encroaches onto Lot 17 and parcels A and B, but these are areas where no grading is proposed. This bedrock may also be exposed in the area of proposed slope repairs on Lot 18 and for the building site and slope repair areas on Lot 19. Serpentine bedrock could also exist along the western edge of the proposed building site for Lot 24. It could also be exposed in cuts for the western terminus of the proposed Ridge and Mt. Tiburon Roads.

*Geology for Planning Central and Southeastern Marin County* indicates that the slope stability of this material varies greatly, depending on the geologic structure and the orientation of the shear zone. Based on the southeast dip orientation mapped for the site, the relative cross-bedding stability of this material could be considered moderate to high. However, the inherent fracturing and jointing of these materials can allow the bedrock structure to fail across-bedding and reduce bedrock stability below that which normally would be anticipated.

**Geomorphology and Landsliding**

A landslide refers to the downward movement of slope-forming materials (such as rock, soil, or fill). This downward movement typically occurs along a surface (geologic contact, slide plane, landslide plane, or discrete slip surface). Landslides are typically caused by one or a combination of the following factors:

- Adding weight (driving force) to the top of a potential slide area.
- Removing mass (lateral or toe support) from the base or margins of a potential slide area.
- Increasing the volume of water into a potential or existing non-flow landslide. This can lead to positive pore pressures, result in partially drained or undrained conditions and ultimately to slope failure.
- Introduction of excessive seepage water (natural or man-made) into the shallow subsurface earth materials on the hillside. Saturation of these shallow earth units can produce a viscous liquid, sometimes leading to rapid-moving mud, debris or avalanche flows.
- Vibrations from earthquakes which also can increase pore pressures.

Engineering geologists identify potential landslide areas based on evaluations of sites’ geology, geomorphology (land shape), and topography (land surface). Examples of standard landslide mitigation methods include grading, installing surface and subsurface drains, and constructing retaining walls or caissons, all before building. When properly implemented and integrated with the site conditions, these methods can eliminate or minimize the potential for damage to man-made structures, off-site properties and roads. The types of slope repair methods, recommended by the applicant’s geotechnical consultants, all consist of these types of engineered structures. The site-specific landslide mitigation measures are discussed in more detail below in the Impacts and Mitigation Measures section of this document.

*Landslides and Other Surficial Deposits* and *Geology for Planning Central and Southeastern Marin County*, regional maps, site-specific mapping, and aerial photographs by HLA, Kleinfelder, and the

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34 Preliminary Photo Interpretation Map of Landslides and Other Surficial Deposits, Tor H. Nilsen, 1975.
EIR geologists indicate that a significant part of the site is covered by landslides and colluvial deposits (see Exhibit 5.4-1). The most plentiful landslide types present on the site are shallow coalescing earth and debris flows with a fewer number of rotational and translational slump landslides and at least one large deep-seated ancient bedrock landslide.

Age classification of landslide deposits can be problematic. This is because some landslides form complexes and overlap each other, while many of the larger slides have other landslides on top of them. Often landslides are formed when new slides calve laterally from preexisting, older slide bodies. Additionally, various soil, rock and landslide units can weather at significantly differing rates, making some landslides appear relatively older than they appear. Presented below is a summary of the generalized field observations typically made by a licensed engineering geologist. The geologist uses these observations, along with subsurface exploration, to estimate the relative activity of the landslides mapped. Included, are Miller Pacific’s classifications of the site landslides by activity based upon these observations. Also included are brief summaries comparing the estimate of slide activity, risk level and Miller Pacific’s conceptual landslide stabilization plan.

A total of 28 landslides have been identified on the project site. These have been designated as Landslides 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 38, 39, and 40. The landslides have been designated (see Exhibit 5.4-2) by Miller Pacific Engineering Group, as either active or dormant, according to the following criteria:

**Active** – active-appearing landslides, having geomorphic features that are visible to the project geologist, such as ephemeral and hummocky topographic features, type of slope movement, evidence of downslope creep of soil (colluvial) deposits, bedrock characteristics, drainage, springs, groundwater conditions and man-made (grading) conditions.

According to Miller-Pacific, it is recommended that active landslides be improved, avoided, or repaired, depending on the specific situation. Seventeen of the 28 landslides have been labeled by Miller Pacific as being of the Active type. Of these, 12 are designated as Risk Level A and five as Risk Level B. It is recommended, by Miller Pacific, that any portion of a slide located within 100 feet of a proposed building site and proposed public improvements, be repaired, with the remaining portions of the slide being improved through engineered methods. This applies to both active and dormant classified landslides. Landslides 10, 38, and 39 are the only active landslides planned to be avoided.

**Dormant** – ancient landslides and those with more subtle and poorly defined geomorphic features, such as eroded hillsides and areas covered with dense vegetative cover (such as large trees) and no outward evidence of recent slope movement. These slides are classified by Miller Pacific as almost

35 *Geology for Planning Central and Southeastern Marin County, op. cit.*

36 The 1996 Easton Point Draft EIR identified a total of 40 landslides. Landslides 24, 26, 28 through 37 are not located on the 110-acre project site and therefore are not evaluated as a part of this EIR. The 1996 Easton Point Draft EIR assessed the 110-acre project site and a second 15-acre parcel, located east of Paradise Drive along the shoreline of San Francisco Bay. The later 15-acre parcel is now in a different ownership and is not part of the project examined in this EIR.


### Exhibit 5.4-2
Conceptual Landslide Stabilization Plan

<table>
<thead>
<tr>
<th>Landslide</th>
<th>Type</th>
<th>Risk Level</th>
<th>Conceptual Stabilization Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Active</td>
<td>B</td>
<td>Improve redirect surface drainage away from existing scarp, remove debris and stabilize scarp with riprap.</td>
</tr>
<tr>
<td>2</td>
<td>Active</td>
<td>A</td>
<td>Repair removal of landslide movement and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
</tr>
<tr>
<td>3</td>
<td>Active</td>
<td>A</td>
<td>Repair with retaining structures and compacted fill buttress in upper portion of slide within 100 feet of building site. Improve lower portion with subsurface drainage.</td>
</tr>
<tr>
<td>4</td>
<td>Active</td>
<td>B</td>
<td>Improve with subsurface drainage; restrict building envelopes greater than 100 feet from landslide.</td>
</tr>
<tr>
<td>5</td>
<td>Dormant</td>
<td>B</td>
<td>Avoid</td>
</tr>
<tr>
<td>6</td>
<td>Active</td>
<td>A</td>
<td>Repair removal of landslide material and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
</tr>
<tr>
<td>7</td>
<td>Active</td>
<td>A</td>
<td>Repair removal of landslide material and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
</tr>
<tr>
<td>8</td>
<td>Active</td>
<td>A</td>
<td>Repair removal of landslide material and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
</tr>
<tr>
<td>9</td>
<td>Active</td>
<td>A</td>
<td>Improve with subsurface drainage; construct debris catchment structure near Paradise Drive.</td>
</tr>
<tr>
<td>10</td>
<td>Active</td>
<td>B</td>
<td>Avoid</td>
</tr>
<tr>
<td>11</td>
<td>Active</td>
<td>A</td>
<td>Repair with retaining structures or compacted fill buttress in upper portion of slide within 100 feet of building site. Improve lower portion with subsurface drainage. Debris fence near Paradise Drive.</td>
</tr>
<tr>
<td>12</td>
<td>Dormant</td>
<td>B</td>
<td>Avoid</td>
</tr>
<tr>
<td>13</td>
<td>Active</td>
<td>B</td>
<td>Repair with compacted fill buttress in upper portion of slide within 100 feet of building site.</td>
</tr>
<tr>
<td>14</td>
<td>Dormant</td>
<td>B</td>
<td>Avoid</td>
</tr>
<tr>
<td>15</td>
<td>Dormant</td>
<td>B</td>
<td>Improve with retaining structure and subsurface drainage within 100 feet of building areas.</td>
</tr>
<tr>
<td>16</td>
<td>Dormant</td>
<td>A</td>
<td>Repair with compacted fill buttress in upper portion of slide within 100 feet of construction access road.</td>
</tr>
<tr>
<td>17</td>
<td>Dormant</td>
<td>B</td>
<td>Avoid</td>
</tr>
<tr>
<td>18</td>
<td>Dormant</td>
<td>A</td>
<td>Improve with subsurface drainage.</td>
</tr>
<tr>
<td>19</td>
<td>Dormant</td>
<td>A</td>
<td>Improve with subsurface drainage.</td>
</tr>
<tr>
<td>20</td>
<td>Dormant</td>
<td>A</td>
<td>Improve with subsurface drainage and retaining structures.</td>
</tr>
<tr>
<td>21</td>
<td>Dormant</td>
<td>A</td>
<td>Improve construct debris catchment structure near Paradise Drive.</td>
</tr>
<tr>
<td>22</td>
<td>Dormant</td>
<td>A</td>
<td>Improve construct debris catchment structure near Paradise Drive.</td>
</tr>
<tr>
<td>23</td>
<td>Active</td>
<td>A</td>
<td>Improve with subsurface drainage; construct debris catchment structure near Paradise Drive.</td>
</tr>
<tr>
<td>26/27</td>
<td>Active</td>
<td>A</td>
<td>Repair with series of retaining structures and subsurface drainage. Coordinate with lot grading plan.</td>
</tr>
<tr>
<td>38</td>
<td>Active</td>
<td>B</td>
<td>Avoid</td>
</tr>
<tr>
<td>39</td>
<td>Active</td>
<td>B</td>
<td>Avoid</td>
</tr>
<tr>
<td>40</td>
<td>Active</td>
<td>A</td>
<td>Repair with retaining structures and subsurface drainage within 100 feet of building site and Paradise Drive.</td>
</tr>
</tbody>
</table>

equally being of Risk Levels A and B, with six being Risk Level A and five being Risk Level B Landslides, respectively.

According to Miller-Pacific, it is recommended that dormant landslides be improved, avoided, or repaired, depending on the specific situation. Eleven of the 28 landslides have been labeled by Miller Pacific as being of the dormant type. Of these, six landslides are designated as Risk Level A and five landslides as Risk Level B. It is recommended, by Miller Pacific, that any portion of a slide located within 100 feet of a proposed building site (and proposed public improvements) be repaired, with the remaining portions of the slide being improved through engineered methods. This conceptual repair applies to Risk Level A landslides, classified as either active or dormant. Thereby, the applicant’s geotechnical consultant has proposed engineered methods, such as drains, walls, and graded fill buttresses to protect the proposed building sites. It is proposed to accomplish this primarily by repairing the upper 100 feet of each of the landslide headscarp areas (within 100 feet of the proposed building sites and related public improvements). Landslides 5, 12, 14, and 17 are the only dormant landslides planned to be avoided.

A brief discussion of each of the 28 previously mapped landslides and the proposed methods of mitigation is provided below and summarized in Exhibit 5.4-2.

The earthflow deposits generally occupy natural swales developed on the higher ridges. Deeper-seated rotational slump blocks generally exist along the lower slopes within thicker colluvial (slope wash) deposits. For the most part, large bedrock slumps are ancient slides which move in small increments adjacent to steep-sided ravines subjected to channel downcutting. Kleinfelder interpreted all except two of the landslides mapped at the site to be ten feet or less deep. The firm identified a landslide in the “bowl” shaped area (encompassing the upper portions of proposed Lots 10, 11, 12, 13, 14, 15, and 42), as about 35 feet deep. As determined by the 1996 exploration by Kleinfelder, the central portion of the bedrock Landslide 11 is believed to be as deep as 65 to 70 feet.

Exhibit 5.4-1 is an interpretive map of site landslides and other surficial deposits prepared by applicant’s geologists. It shows typical disbursement of the various landslides and surficial soil deposit types present on the site mapped by the previous studies and the EIR geologists. Aerial photographs were also used extensively to make these assessments.

Franciscan Assemblage and associated bedrock materials are regularly intersected by joint sets which typically are more-or-less orthogonal to bedding. As a consequence, at least one of the joint sets is sub-parallel to the hillslope. The presence of joints under low confining pressure reduces bedrock cohesion and provides ample conduits for groundwater infiltration and migration. This interpretation regarding the likely groundwater regime and potential source area is consistent with the conclusions made by Questa Engineering Corporation, the applicant’s groundwater consultant. Questa concluded that the source of the groundwater for Keil spring is water seeping down through the fractured bedrock on the ridge into the soils and other earth units below.

39 Ibid.
40 Land Assessment and Mitigation: Easton Point, Tiburon, op. cit.
41 Ibid.
42 Ibid.
The colluvial deposits of varying thickness found on steeper slopes and in swales appear to be composed of soil, decomposed bedrock, and debris flow detritus. Soil and rock debris in colluvial deposits were derived by weathering and decomposition of the bedrock materials underlying the slopes on which they were found and are present on most slopes in the central and southeast Marin areas. Many landslides of the debris flow and avalanche types in southeast Marin originated in colluvium.

History has shown that the general area has been subject to debris flow landsliding in the recent past. A published geologic report by the U.S. Geological Survey shows that in the 1968-1969 winter season, more than 40 landslides were reported in Marin County. During the 1972-1973 storms, over 100 landslides occurred in Marin County, with one slide present within the project site. Of greatest concern was the winter of 1982 where over 4,600 debris flow landslides occurred in Marin County in early January. In 1982, two homes near the site were damaged and one person was killed, by debris flows. This confirms the propensity for stormwater related debris flows in the area of the project site and therefore, the importance of implementing adequate mitigative and protective measures to prevent future property damage and/or loss of life.

The landslides observed on the site represent coalescing earthflows, as well as larger rotational and translational type failures. Most of these landslides appear to have occurred within unstable colluvial deposits and the highly-weathered and jointed bedrock of the unnamed and Franciscan-designated materials. Many of the slides appear to be relatively shallow earthflows. However, one large-scale ancient bedrock landslide exists on the site. The ancient bedrock slide complex (Landslide 11) subsequently has been dissected by smaller near-surface erosional processes (such as colluvium production, earthflows, and simple erosion). These smaller features represent more geologically youthful events, which are more typical of those physical processes dominating the area over the past 11,000 years.

Exhibit 5.4-1 shows the largest coalescing landslide complex on-site. This complex is made up of several shallow slides and one ancient bedrock landslide, Landslide 11. Landslide 11 is present in the area of bowl-shaped topography in the central part of the site, northwest of Keil Cove. This landslide feature is inferred to extend from the Lands of Keil downhill beyond Paradise Drive. The CDMG previously mapped this landslide.

**Landslide Mitigation Policy**

Marin County has written policies that require the submittal of a geotechnical report for development applications. The geotechnical report must be signed by a registered geotechnical engineer or a State certified engineering geologist. The report must address the geotechnical conditions at the site and must commit to appropriate and comprehensive mitigation measures sufficient to reduce geotechnical risks associated with the proposed development to an acceptable level. The report must also address the impact of proposed development, including site grading and geotechnical remediation on adjacent lands, and the potential impacts of off-site geotechnical conditions on the proposed project.

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44 Holocene epoch -- the past 11,000 years -- is the present interglacial warm period in which we are living.

45 Likely a Pleistocene feature that formed during a wetter period about 100,000 years ago.

46 Geology for Planning Central and Southeastern Marin County, California, op. cit.
Marin County considers the potential effects of the proposed development project on the existing site conditions. For example, if a proposed project does not have an impact on an existing landslide and would not further exacerbate the existing landslide, and the applicant chooses not to take measures to remedy the landslide, then the Department of Public Works (DPW) does not require conditions of approval that require the existing landslide to be repaired or remedied.

Marin DPW relies on the recommendations of the project geotechnical engineer concerning landslide repair and remediation. Marin DPW reviews the geotechnical report for adequacy and takes into consideration the findings of any peer review in initial studies and EIRs. If Marin DPW determines that the recommendations contained in a geotechnical report are not adequate they may ask for an independent peer review.

As a part of the project application a preliminary geotechnical report has been prepared. As a part of the preparation of the preliminary geotechnical report Miller Pacific Engineering Group (Miller Pacific) prepared a landslide mitigation policy for the 2008 Easton Point Residential Development project. Miller Pacific’s policy is described below:

Landslides that have a higher potential to affect existing or proposed improvements (Risk Level A landslides) will be improved or repaired. Portions of Risk Level A landslides or debris flow source areas within 100 feet of a building site or planned public improvement will be repaired. Landslide improvement (i.e. diversion structure, protective barriers and / or subsurface drainage) will be provided for landslide flow paths that cross the building site, or portions of Risk Level A landslides that could potentially impact existing off-site public improvements (i.e. Paradise Drive). Landslides with a lower potential to affect existing or proposed improvements (Risk Level B landslides) will be avoided or improved. Risk Level B landslides include active or dormant landslide areas on the property that do not have the potential to significantly damage property or improvements within or outside the property. In most instances, Risk Level B landslides are located in proposed undeveloped or open space areas.

Landslide Repair – Miller Pacific’s proposed landslide repair program would improve the stability of portions of landslides within 100 feet of the building sites and proposed public improvements such that the calculated factor of safety is at least 1.5 for static conditions and greater than 1.0 for

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49 As discussed in Chapter 3.0 Description of the Proposed Project each residential lot would include a building site (see Exhibit 3.0-4). All development (residence, patios, pools, gardening sheds, etc.) would be contained within the building site.

50 The factor of safety is defined as the ratio of the resisting forces to the driving forces. Slopes with a factor of safety less than 1.0 are unstable. The higher the factor of safety, the more stable the slope. For pseudo-static analyses, the ground acceleration determined from deterministic methods or the probabilistic ground acceleration that corresponds with a 10 percent chance of being exceeded in 50 years.
pseudo-static (seismic) conditions. The applicant’s geotechnical consultant calls for improved stability which may be accomplished by various methods or a combination of methods including:

- Excavation of unstable material, installation of subsurface drainage and construction of a compacted earth fill buttress;
- Design and construction of retaining structures (above and below ground pile walls and shear keys);
- De-watering with subsurface drainage;
- Removal of the entire unstable landslide mass; or
- Other methods acceptable to Marin County.

Within a potential debris flow path, provide a protective catchment structure, such as a debris fence, to catch or slow a debris flow and reduce the potential to significantly impact building sites or off-site improvements.

**Landslide Avoidance** - Requires locating structures and improvements an adequate distance from an existing landslide so that any future movement of the landslide would not likely affect the proposed structures or improvements.

**Landslide Improvement** - Maintain or marginally improve the stability of portions of existing landslides more than 100 feet from the proposed building sites and proposed on-site public improvements. Improvement also includes efforts to maintain or improve stability of portions of landslides within 100 feet of existing off-site public improvements. Improvement may include subsurface drainage or construction of protective structures below the landslide and within a potential debris flow path to provide a reasonable level of additional protection for existing public improvements (i.e. Paradise Drive).

A comparison of the Marin County policy and the Miller Pacific policy developed for the proposed project indicates that the two policies are generally compatible. The Miller Pacific policy, however, is stricter than the County policy. For example, the County policy does not require specific performance standards, such as factors of safety and instead defers to the recommendations of the applicant’s engineering geologist and/or geotechnical engineer. Once an applicant’s geotechnical consultant submits a landslide stabilization plan, and it is reviewed and approved by Marin County, the applicant would be required to implement the plan.

**Artificial Fill**

The site presently is undeveloped. Therefore, minimal artificial fill is present. The only measurable fill on the site is anticipated to be adjacent to contiguous development, access roads, and the Marin Municipal Water District's (MMWD’s) Paradise Water Tank.

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51 It is understood that to date Miller Pacific has not performed stability calculations to confirm that the proposed repair methods would yield the respective factors of safety. Rather, Miller Pacific relies on its experience with other projects in the site vicinity.
Groundwater

Because of the numerous landslides located on the site, some of the groundwater probably is perched in or adjacent to them. An example is the Lands of Keil spring. It is located in the area of a landslide complex and thereby almost completely within Landslide 11. The spring supplies water to the Keil Cove property and is used for landscape irrigation. Based on its location with respect to topography, the spring may tap into a fracture zone of the weathered bedrock near the top of the ridge and to a lesser extent, perched water from the landslide deposits adjacent to the Keil spring. Questa Engineering prepared a Supplemental Groundwater Investigation (Investigation) for the applicant. 52 This Investigation was directly focused on assessing the potential impacts to the Keil Spring source that may occur as a result of the proposed development. Questa Engineering performed chemical testing of groundwater samples and interprets the source of water for Keil Spring as the fractured and faulted bedrock from near the top of Ridgeline C. The Investigation makes no mention of any landsliding on the project site. Additionally, the report did not reference any of the past geologic work by Kleinfelder and others in the past. This apparent omission was questioned by the EIR geologist in a memo from the County to the applicant. 53 In response to these comments, Questa prepared an addendum report. 54 Questa explained that while all of the previous consultant’s reports were reviewed, the data were not used in their analysis in the letter because the past reports did not address the on-site groundwater conditions. It is stated in the addendum letter that upon secondary review of the past reports, they could find no inconsistencies. Also in response to the comments, Questa revised their geologic cross-section to include the landslide deposits previously mapped by the applicant’s geologist, Mr. Steven Korbay. In Questa’s conclusions a series of infiltration trenches to collect subsurface water were recommended. This water would then be discharged at a suitable location below Keil Spring.

Miller Pacific also responded to the County review letter in their geotechnical response letter. 55 Miller Pacific explained that they consulted with Questa and that they are familiar with the on-site geologic conditions. The letter concludes that, “we believe as does Questa, that the source of the springs on the Lands of Keil originate from surface water infiltration of the fractured bedrock that underlies the slope between the springs and the ridge to the northwest which is the location of the planned lots.” Regarding the potential impacts of development on the Lands of Keil, Miller Pacific further concludes that shallow groundwater (upper 15 feet below ground surface) may be intercepted by the proposed pad grading and the landslide remediation. Therefore, there is a potential for the proposed subsurface dewatering associated with landslide mitigation or improvement, to divert source water away from Keil Spring and some of the other slope seeps.

The applicant’s consultants, Miller Pacific and Questa, recommend bioswales, infiltration trenches and permeable pavement, where local geotechnical conditions permit, that would allow for some on-site infiltration of stormwater runoff.


53 Letter to Martha Company (project applicant) from John Roberto, Notice of Project Status, December 30, 2008.

54 Addendum to Supplemental Groundwater Investigation dated November 4, 2008, Easton Point Subdivision, Marin County, California, Questa Engineering, Corp., April 16, 2009.

However, there is a potential for the proposed subsurface dewatering associated with landslide mitigation or improvement, to divert source water away from Keil Spring.

**Seismic Hazards**

The site is located in the seismically active San Francisco Bay Region. Fault rupture and strong seismic ground shaking are inevitable in this portion of the Coast Range province and there is a reported 93 percent probability of at least one magnitude 6.7 or greater earthquake within the next 30 years in northern California. There are no known faults with the potential for surface rupture within the site; however, several known active faults with the potential for rupture are present in the region. The Working Group for California Earthquake Probabilities has calculated the 30-year probability of a magnitude 6.7 or greater earthquake on these faults, which are listed below by greatest to least probability of rupture within the next 30 years: Hayward-Rodgers Creek (31 percent), Northern San Andreas (21 percent), Calaveras (seven percent), San Gregorio (six percent), Concord-Green Valley (three percent), Greenville (three percent), and Mount Diablo Thrust (one percent).

The applicant’s geotechnical consultant, Miller Pacific, has mapped two old, inactive faults trending across the site. The traces of the faults are mapped as cutting directly across the topography, indicating that the faults are assumed to be vertical in orientation. These faults have not been mapped by others and there are no active faults located in the vicinity of the subject site. Therefore, if these features are present, they are extremely old, tectonic in nature and inactive.

In Marin County, the San Andreas Fault is the only fault considered sufficiently active to be zoned under the Alquist-Priolo Earthquake Fault Zoning Act. The last surface ground rupture was in 1906. The Hayward Fault is also zoned under the Zoning Act, but in Marin County, it lies offshore in the Bay. The fact that the San Andreas fault is the only land based zoned fault in the County does not rule out the possibility of fault rupture on some of the other known faults in the region or on potentially unknown faults.

Recent research indicates that there exists the potential for blind thrust fault(s) to be present beneath Marin County. These faults are not exposed at the surface. In the Bay region, the Mt. Diablo blind thrust fault, which is associated with the Diablo Range, is reported to possibly be capable of a magnitude 6.75 earthquake. A similar blind thrust fault association is suggested for the anomalously high Mt. Tamalpais. Due to the buried nature of these thrust faults, their existence has typically not been known until they produce an earthquake. The risk for surface rupture potential of

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these buried thrust faults is inferred to be low. However during rupture of a buried thrust fault, distribution of permanent surface ground deformation and damage to man-made structures has been observed and is interpreted to be from movement on coactive slip on other blind faults.  

Ground shaking is the primary cause of damage during an earthquake. The intensity of ground shaking felt by a structure during an earthquake is largely dependent on the type of underlying earth materials. Earthquake waves will travel through bedrock differently than they will travel through younger surficial deposits. Typically, structures built on poorly consolidated sediments will experience longer shaking duration and greater surface wave amplitude than those built on bedrock or other stiffer geologic deposits. Severity of ground shaking damage is also largely dependent on the magnitude and distance from the earthquake source and the type and quality of construction of the structure being affected. The project site is underlain by bedrock exposed at or near the surface; and, in general, the severity of ground shaking would likely be less significant than other areas in Marin County constructed on young soft sediment. However, some of the landslide deposits mapped on the site consist of weak material that may be susceptible to movement due to strong ground shaking.

The mitigation of strong ground shaking requires earthquake resistant structural design. Designing structures to be earthquake-proof is generally considered to be impractical, especially of residential dwellings, due to cost limitations. Significant damage to structures may be unavoidable during large earthquakes. Therefore, at a minimum the structural design of the proposed structures should be based on the 2007 California Building Code (CBC). These minimum code values are intended to protect life and may not provide an acceptable level of protection against significant cosmetic damage and serious economic loss. In addition, mitigation of weak deposits is best performed by removing and/or improving these materials to withstand strong ground shaking.

**Soils Characteristics**

The *Soil Survey of Marin County, California* identifies three soil types on the site, two of which were lumped together by the USDA. These soil types are classified in accordance with the Unified Soil Classification System (ASTM Designation D-2487). They are designated as belonging to the Tocaloma-McMullin complex and the Henneke stony clay loam.

**Tocaloma and McMullin complex**

* Tocaloma soil characteristically is formed in material derived from sandstone or shale, is well-drained, has a plasticity index of five to ten, and is moderately deep (ranging from 20 to 40 inches to weathered bedrock). The loam (zero to 19 inches deep) is classified as a fine-grained soil of inorganic silts and clays with liquid limits of 50 percent or less. The gravelly loam (19 to 39 inches) is classified as a coarse-grained soil of silty and clayey gravels with fines. Both loams have low shrink-swell potentials. Deposits of Tocaloma soil reportedly are found in convex side slopes.

* McMullin soil characteristically is formed in material derived from sandstone, is well-drained, has a plasticity index of NP (no plasticity) to 15, and is shallow (ranging from ten to 20 inches to unweathered bedrock). The gravelly loam (zero to four inches deep) is classified as a coarse-grained soil of silty sands with fines. The gravelly clay loam (four to 18 inches) is classified as a fine grained soil of inorganic silts and clays with liquid limits of 50 percent or less. Both loams have low shrink-

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swell potentials. Deposits of McMullin soil reportedly are found near the upper parts of convex side slopes.

Water infiltrates the Tocaloma-McMullin soils moderately rapidly, and these soils tend to erode easily during storm events. Vegetation planted on slopes minimizes sloughing and erosion from runoff.

**Henneke stoney clay loam**

*Henneke stoney clay loam* is formed in material derived from serpentine. Henneke stony clay loam generally is found in shallow deposits, only ten to 20 inches thick, and contains a high percentage of rock fragments mixed with clay. It transmits water moderately slowly and is easily eroded. Its reported shrink-swell potential also is considered to be low.

Other descriptions concerning shrink-swell potential of soils derived from the bedrock materials present on the site, as well as site-specific laboratory testing; do not agree with the interpretation of the *Soil Survey. Geology for Planning Central and Southeastern Marin County, California* describes the bedrock materials present on-site to yield soils of moderate to high expansion potential. In addition, plasticity index tests performed by Kleinfelder also indicate that the shrink-swell potential for project site soils ranges from moderate to high.

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62 *Geology for Planning Central and Southeastern Marin County, California, op. cit.*

63 *Geologic and Geotechnical Investigation, Easton Point Development, op. cit.*
Geology and Soils – Significance Criteria

The geology and soils analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review guidelines. Based on the State CEQA Guidelines, the project would have a significant geologic impact if it:

**Geologic Hazards**

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; and
  - Landslides.
- Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

**Soils and Grading**

- Result in substantial soil erosion or the loss of topsoil.

**Expansive Soil**

- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

**Wastewater Disposal Issues**

- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

**Mineral Resources**

- Be located in a Mineral Resource Zone identified by the California Department of Mines and Geology.

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64 Table 18-1-B of the Uniform Building Code (“Classification of Expansive Soil”) simply states the potential expansion as a function of the expansion index of the soil (an Expansion Index of 1-20 has a Very Low potential expansion, 21-50 has Low, 51-90 has Medium, 91-130 has High, and above 130 has Very High potential expansion). The expansion index of the various sites has not been determined, and normally is not determined until site-specific geological investigations are conducted. This would not occur for this project until a project site is selected.
Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant geologic impact if it would be located:

- Within an Alquist-Priolo Special Studies Zone, a known active fault zone, or an area characterized by surface rupture that might be related to a fault.

- In an area with substrate consisting of material that is subject to liquefaction or other secondary seismic hazards in the event of ground shaking.

- In an area with evidence of static hazards, such as landsliding or excessively steep slopes, that could result in slope failure.

- In the vicinity of soil that is likely to collapse, as might be the case with karst topography, old mining properties, or areas of subsidence caused by groundwater drawdown.

- In an area with soils characterized by shrink/swell potential that might result in deformation of foundations or damage to structures.

- In a Mineral Resource Zone identified by the California Department of Mines and Geology.

Section 15126.2 of the State CEQA Guidelines states that an EIR shall identify and focus on the significant environmental effects of the proposed project. Typically this analysis is limited to changes in the existing physical conditions. EIRs also should evaluate any potentially significant impacts of locating development in areas susceptible to hazardous conditions as identified in authoritative hazard maps, risk assessments, or in land use plans addressing such hazard areas. As described in this section numerous landslides exist on the project site. This EIR analyzes the project’s potential effect on the existing landslides or potential effects of locating development in areas susceptible to landslides. If should be noted that if an existing condition on the project site (such as the identified landslides) is not impacted by the proposed project than the fact that the existing condition remains is not a significant impact of the proposed project under CEQA.
LANDSLIDE REPAIR

The locations of the on-site landslides and the approximate distribution of other geologic units are shown on Exhibit 5.4-1 (same as Exhibit 3.0-9). Based on mapping by Miller Pacific 65 the approximate surface areas of the landslides have been included in this section to help illustrate the potential zones of disturbance created by the proposed mitigation measures. Miller Pacific estimates that grading and excavating for landslide stabilization would involve about 53,156 cubic yards of material. The following is a brief discussion of each of the 28 previously mapped landslides and the proposed methods of stabilization.56 Miller Pacific has proposed methods of stabilization or improvement for the site landslides through the use of subdrains, shear keys, pier and grade beams, and debris fences.

Exhibit 5.4-2 describes the proposed landslide stabilization for the on-site landslides. Exhibit 5.4-3 illustrates the proposed landslide stabilization program. Exhibit 5.4-4 illustrates the type of landslide repairs the applicant’s geotechnical consultants propose.

Landslide 1

Landslide 1 is located near the southwest corner of the site, on Lot 8, along the boundary with Old St. Hilary’s Open Space Preserve. This slide straddles the two properties, with the crown of the landslide on the Easton Point project site and the majority of the slide on the adjacent property. The limits of Landslide 1, as shown on Exhibit 5.4-1, have not been mapped in detail offsite but this relatively small landslide appears to have a surface area of approximately 5,000 square feet. The top of the landslide is located about 200 feet away laterally and 40 feet in elevation below the proposed building site for Lot 8. Miller Pacific recommends improvement of the landslide by removing slide debris and installing riprap on the slope above, to increase slope stability and to control surface drainage and subsurface water (see Exhibit 5.4-3). Miller Pacific estimates that improvement of this landslide could involve grading quantities of 280 cubic yards.

Landslide 2

Landslide 2 is also located near the southwest corner of the site, on the same slope, just northeast of Landslide 1. This landslide is located almost entirely on Lot 9, but its mapped upslope limits do extend into Lot 37. The limits of Landslide 2, as shown on Exhibit 5.4-1, show the surface area of this moderate sized landslide, to be approximately 8,300 square feet. Landslide 2 encompasses much of the proposed building site for Lot 9. The landslide is also less than 100 feet laterally and below the proposed building site for Lot 37. Miller Pacific recommends complete repair of Landslide 2 through removal and recompaction of this landslide (see Exhibit 5.4-3). The slope would also be

65 Sheet GR1 Landslide Exhibit, Miller Pacific Engineering Group, revised May 26, 2010.

Geologic Map Explanation

- Contour intervals are 10 feet.
- Landslide deposits are represented.
- Solid lines indicate property lines.
- Dotted lines indicate roads.
- Wavy lines indicate streams.
- Legend indicates various geological features.

Source: Miller Pacific Engineering Group, 2010

Approximate Scale (Feet)

Conceptual Geologic Repair Solutions

1. Remove a slope to reduce potential landslide (See Figure 7 of the engineering report).
2. Barred failed part of slope with wall.
4. Repair failure.
reconstructed and subdrainage would be added. Miller Pacific estimates that repair of this landslide could involve grading quantities of 6,047 cubic yards.

**Landslide 3**

Landslide 3 is a large landslide complex located on a south facing slope, along the south boundary of the site. Much of the slide extends offsite onto the Hill Haven subdivision, in the area of Straights View Drive. The areal extent of Landslide 3 crosses into and affects, Lots 6, 16, 17, 18, 19, and Parcel A. The limits of Landslide 3, as shown on Exhibit 5.4-1, have not been mapped off site. This large landslide complex has an approximate on-site surface area of over 200,000 square feet. This landslide encompasses much of the proposed building sites for Lots 16 through 19. It just encroaches onto the northeast corner of Lot 6. The proposed building site for that lot lies just over 100 feet laterally, and on the other side of the ridge from this landslide. Landslide 3 also covers a large portion of Parcel A. Miller Pacific recommends complete repair of the upper portion of the landslide within 100 feet of the proposed building sites and improving the slope stability in other areas on the project site (see Exhibit 5.4-3). The upper portions of the slide would be repaired through the use of retaining structures with subdrains and/or grading. Grading would involve removal and recompacon of unstable materials to yield an engineered, compacted fill buttress. Miller Pacific estimates that repair and improvement of this landslide could involve grading quantities of about 24,593 cubic yards.

**Landslide 4**

Landslide 4 is a small landslide on the same, south facing slope, just east of Landslide 3. This slide is also located along the southern boundary of the site. Landslide 4 lies entirely within Parcel A, and is above Lot 21 and Landslide 5. This landslide has an approximate surface area of 17,000 square feet. Landslide 4 is more than 100 feet laterally from the nearest building site on Lot 15. Miller Pacific recommends that this landslide be improved through the use of subdrains (see Exhibit 5.4-3). They also recommend that the building site be limited to over 100 feet away from this feature. Grading would be expected to be limited to the removal and replacement of soils needed to install the proposed “crow’s foot” subdrain system. Miller Pacific estimates that improvement of this landslide would involve grading quantities of about 62 cubic yards.

**Landslide 5**

Landslide 5 is a relatively small landslide located on a south facing slope, along the south boundary of the site. The slide toes out just outside the project site into a ravine within the limits of the Hill Haven subdivision, in the area of Spanish Trail. Landslide 5 straddles the line and lies partially within Parcel A and Lot 21. This landslide has an approximate on-site surface area of 8,500 square feet. Landslide 5 is not near any of the proposed building sites. The nearest potential building site, on Lot 21, is over 200 feet to the east. Therefore, Miller Pacific recommends avoidance of this landslide by locating any proposed building sites at least 100 feet away (see Exhibit 5.4-3). Because no repair or improvements are contemplated for Landslide 5, grading is not anticipated.

**Landslide 6**

Landslide 6 is located on a southeasterly descending slope above Paradise Drive, just northeast of Landslide 5. This landslide is located entirely on Lot 21. The slide has been mapped as extending down to Paradise Drive. At the toe of the slope, the landslide crosses the area of a proposed driveway that is proposed to access Lots 21 through 23. The driveway is proposed to extend northerly from Paradise Drive that lies below. Based upon the limits of Landslide 6, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 12,000 square feet. At present, this landslide could potentially pose a threat to the access driveway, Paradise Drive, and the proposed building site for Lot
21. The landslide is less than 100 feet laterally to the south from the building site, and extends in elevation from about 25 feet above the proposed building site to 45 feet below. Miller Pacific recommends complete repair of Landslide 6 through removal and recompaction (see Exhibit 5.4-3). The slope would also be reconstructed and subdrainage would be added. Miller Pacific estimates that repair of this landslide could involve grading quantities on the order of 4,037 cubic yards.

**Landslide 7**

Landslide 7 is located on a southeast descending slope above Paradise Drive, just north of Landslide 6. The landslide is located almost entirely on Lot 22, but slightly crosses the line into Lot 21. The slide has been mapped as extending down to Paradise Drive. At the toe of the slope, the landslide crosses the area of the proposed driveway that is proposed to access Lots 21 through 23. The driveway is proposed to extend northerly from Paradise Drive that lies below. Based upon the limits of Landslide 7, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 13,000 square feet. At present, this landslide could potentially pose a threat to the driveway, Paradise Drive, and the proposed building sites for Lots 21 and 22. The landslide lies above Paradise Drive, crosses the driveway and is less than 100 feet laterally from the proposed building sites for Lots 21 and 22. Topographic relief for the landslide is approximately 75 feet, from the toe of the slide to the landslide headscarp. Miller Pacific recommends complete repair of Landslide 7 through removal and recompaction of this landslide (see Exhibit 5.4-3). The slope would also be reconstructed and subdrainage would be added. Miller Pacific estimates that repair of this landslide could involve grading quantities on the order of 4,122 cubic yards.

**Landslide 8**

Landslide 8 is located on an easterly descending slope above Paradise Drive, just north of Landslide 7. Landslide 8 is located entirely on Lot 23 and has been mapped as extending down to Paradise Drive. At the toe of the slope, the landslide crosses the area of the proposed driveway that is proposed to access Lots 21 through 23. The driveway is proposed to extend northerly from Paradise Drive that lies below. Based upon the limits of Landslide 8, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 10,000 square feet. At present, this landslide could potentially pose a threat to the driveway, Paradise Drive, and the proposed building sites for Lots 22 and 23. The landslide lies above Paradise Drive, crosses the driveway and is less than 100 feet laterally from the proposed building sites for Lots 22 and 23. Topographic relief for the landslide is approximately 60 feet, from the toe of the slide to the landslide headscarp. Miller Pacific recommends complete repair of Landslide 8 through removal and recompaction of this landslide (see Exhibit 5.4-3). The slope would also be reconstructed and subdrainage would be added. Miller Pacific estimates that repair of this landslide could involve grading quantities on the order of 3,364 cubic yards.

**Landslide 9**

Landslide 9 is a relatively large landslide located in a ravine on an easterly descending slope above Paradise Drive, just north of Landslide 8. Landslide 9 is partially located on Lot 23, but much of it extends onto Parcel A. Based upon the limits of Landslide 9, as shown on Exhibit 5.4-1, this slide has an approximate surface area of potential disturbance of 37,500 square feet. At present, this landslide could potentially pose a threat to Paradise Drive and the proposed building site for Lot 23. The landslide has been mapped as being immediately above Paradise Drive and is less than 100 feet laterally from the proposed building site for Lot 23. The slide is also about 100 feet from the adjacent Chapman residence (2641 Paradise Drive). Topographic relief for the landslide is as much as 220 feet, from the toe of the slide to the landslide headscarp. Miller Pacific recommends that Landslide 9 be improved through the use of a “crow’s foot” subdrain and construction of a debris fence on piers with
a catchment structure above Paradise Drive (see Exhibit 5.4-3). Miller Pacific estimates that improvement of this landslide would involve grading quantities on the order of 285 cubic yards. For this landslide that is located within 100 feet of the proposed building site on Lot 23, it is proposed to improve the stability of the slide through the use of subdrainage to be placed down the axis of the slide and a debris fence to be located at the toe of the slope above Paradise Drive. It is not proposed to repair this landslide by bringing its respective factors of safety up to 1.5 and 1.0 for static and pseudo-static conditions. This would deviate from the applicant’s geotechnical consultant’s landslide policy that requires repair of landslides near (within 100 feet) proposed building sites.

**Landslide 10**

Landslide 10 has been mapped by Miller Pacific as a small slide that forms a complex with the much larger Landslide 9. This landslide has been mapped on the same east facing slope and along the north boundary of Landslide 9. Landslide 10 is located entirely within Parcel A. This landslide has an approximate surface area of about 3,600 square feet. Landslide 10 is not near any of the proposed building sites. The nearest potential building site, on Lot 23, is over 150 feet to the south. Therefore, Miller Pacific recommends avoidance of this landslide by locating any proposed building site at least 100 feet away (see Exhibit 5.4-3). Because no repair or improvements are contemplated for Landslide 10, grading is not anticipated.

**Landslide 11**

Landslide 11 is a mega-slide complex that covers much of the project site. This landslide complex is located on the east facing slope and extends from the ridge all the way down to Paradise Drive. In areal extent, Landslide 11 crosses into and affects Lots 10 through 15, 41, 42, 43, Parcel A, the Lands of Keil, and potentially the proposed Mt. Tiburon Road. The limits of the Landslide 11 are shown on Exhibit 5.4-1. This large landslide complex has an approximate on-site surface area on the order of 700,000 square feet. Landslide 11 underlies much of the proposed building sites for Lots 10 through 15 and encroaches to within 100 feet of the proposed building sites on Lots 41 through 43. Landslide 11 also underlies a large portion of Parcel A. The top of the landslide is about 100 feet below the proposed Mt. Tiburon Road. Landslide 11 has also been mapped by Miller Pacific as covering an area that constitutes at least 40 percent of the 0.51-acre Lands of Keil parcel. Topographic relief for the landslide is over 400 feet, from the toe of the slide at Paradise Drive to the landslide headscarp. Because this is such a large and varying slide complex, Miller Pacific recommends a combination of mitigation measures to repair or improve portions of the landslide (see Exhibit 5.4-3). They call for repair with retaining structures and/or compacted fill buttresses in the upper portions of the slide within 100 feet of proposed building sites. For the lower portions of Landslide 11, they recommend improvement with subsurface drainage. They also recommend a debris fence on piers near Paradise Drive. Miller Pacific estimates that repair and improvement of this landslide could involve grading quantities of about 5,487 cubic yards.

**Landslide 12**

Landslide 12 is mapped as a long and narrow, run-out slide. The landslide is located on the same east facing slope and just north of Landslide 11. Landslide 12 is located entirely within Parcel A. This landslide has an approximate surface area of about 28,500 square feet. Landslide 12 is not located near any of the proposed building sites. Miller Pacific recommends avoidance of this landslide by

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67 Ibid.
locating any proposed building sites at least 100 feet away (see Exhibit 5.4-3). Because no repair or improvements are contemplated for Landslide 12, grading is not anticipated.

**Landslide 13**

Landslide 13 is located on the same east facing slope as Landslides 11 and 12. This landslide is located directly above Landslide 12 and extends into Parcel A, the Lands of Keil, and Lots 39 through 41. Based upon the limits of Landslide 13, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 45,000 square feet. At present, this landslide could potentially pose a threat to the proposed building sites for Lots 39 through 41. The landslide is less than 100 feet laterally from the building sites for these lots. Topographic relief for the landslide is approximately 130 feet, from the top of the slide to Landslide 12 below. Miller Pacific recommends repair of the landslide with a compacted fill buttress within 100 feet of the proposed building sites (see Exhibit 5.4-3). Miller Pacific estimates that repair of the upper portion of this landslide could involve grading quantities of about 4,453 cubic yards.

**Landslide 14**

Landslide 14 is mapped by Miller Pacific as a small debris flow slide. The small landslide is located on the same east facing slope as most of the other landslides. Landslide 14 is located entirely within Parcel A. This landslide has an approximate surface area of 6,900 square feet. Landslide 14 is not located near any of the proposed building sites or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed building sites at least 100 feet away (see Exhibit 5.4-3). Because no repair or improvements are contemplated for Landslide 14, grading is not anticipated.

**Landslide 15**

Landslide 15 has been mapped by Miller Pacific as a small slide. This landslide is located just above Landslide 14. Landslide 15 is located entirely within proposed Parcel A. This landslide has an approximate surface area of about 6,000 square feet. Landslide 15 is not located near any of the proposed building sites, but it is within 100 feet of the proposed temporary construction access road. To protect the proposed construction road, Miller Pacific recommends improvement of Landslide 15 through the use of a buried pile wall (shear key) with subsurface drainage (see Exhibit 5.4-3). Miller Pacific estimates that improvement of this landslide would involve grading quantities of about 39 cubic yards. Even though it is located within 100 feet of the temporary construction road it is not proposed to repair this landslide by bringing its respective factors of safety up to 1.5 and 1.0 for static and pseudo-static conditions. This is because Marin County Department of Public Works considers the proposed temporary construction road to not be a required public improvement for the proposed project. In addition, as discussed in Section 5.1 Transportation, the temporary construction road would not be used for emergency vehicle access to the site. Therefore, the need for adherence to the project’s accepted landslide repair criteria is negated in this particular specific case. The County and applicant’s geotechnical consultant would, therefore, not require complete repair of Landslide 15, near (within 100 feet), of this temporary road.

**Landslide 16**

Landslide 16 is located at the west boundary of the project site adjacent to Parcel C and the Old St. Hilary’s Open Space Preserve. From the ridgeline, the slide descends to the east and into Parcel A. This landslide is mostly on Parcel A, but does encroach slightly into the north end of Lot 39. The landslide crosses the area of the proposed construction access road that would connect Mt. Tiburon Road and Forest Glen Court. Landslide 16, as shown on Exhibit 5.4-1, has an approximate surface area of 40,000 square feet. At present, this landslide could potentially pose a threat to Parcel C. The
landslide is over 100 feet laterally and to the north of the proposed building site for Lot 39. Miller Pacific recommends repair of the upper portion, within 100 feet of the proposed water tank and construction access road through the use of a compacted fill buttress (see Exhibit 5.4-3). Miller Pacific estimates that repair of this landslide with a compacted fill buttress on the order of 4,886 cubic yards.

Landslide 17

Landslide 17 is mapped as a small debris flow slide. The small landslide is located inside the Landslide 11 complex. Landslide 17 is located entirely within Parcel A. This landslide has an approximate surface area of about 6,600 square feet. Landslide 17 is not located near any of the proposed building sites or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed building sites at least 100 feet away (see Exhibit 5.4-3). Because no repair or improvements are contemplated for Landslide 17, grading is not anticipated.

Landslide 18

Landslide 18 is a small landslide and is located within a ravine, on the southeasterly facing slope, about 50 feet above Paradise Drive. Landslide 18 is partially located on Lots 26 and 27, but much of it extends below, onto Parcel A. Based upon the limits of Landslide 18, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 9,500 square feet. The landslide is over 100 feet from the proposed building sites for Lots 26 and 27. Topographic relief for the landslide is about 30 feet, from the top of the slide to the toe. Miller Pacific recommends that Landslide 18 be improved through the use of subsurface drainage (see Exhibit 5.4-3). Miller Pacific estimates that improvement of this landslide would only involve grading quantities on the order of 41 cubic yards.

Landslide 19

Landslide 19 is located within a ravine, on the east facing slope, just east of Parcel C. Landslide 19 is entirely located within Parcel A, however it is only 25 feet from the construction road that is proposed to connect Mt. Tiburon Road and Forest Glen Court. Based upon the limits of Landslide 19, as shown on Exhibit 5.4-1, this small slide has an approximate surface area of 6,000 square feet. Topographic relief for the landslide is about 75 feet from the top of the slide to the toe. Miller Pacific recommends that Landslide 19 be improved through the use of subsurface drainage to help protect the proposed construction road (see Exhibit 5.4-3). They estimate that improvement of this landslide would involve grading quantities on the order of 32 cubic yards.

Landslide 20

Landslide 20 is located within a ravine on the same east facing slope as Landslide 19. The landslide lies just north of Parcel C. Landslide 20 is entirely located within Parcel A; however it is only 40 feet from Parcel C. Based upon the limits of Landslide 20, as shown on Exhibit 5.4-1, this small slide has an approximate surface area of 6,500 square feet. Topographic relief for the landslide is about 125 feet, from the top of the slide to the toe. Miller Pacific recommends that Landslide 20 be improved through the use of subsurface drainage and retaining structures to help protect Parcel C (see Exhibit 5.4-3). They estimate that improvement of this landslide would involve grading quantities on the order of 49 cubic yards.

Landslide 21

Landslide 21 is a large landslide located within a broad ravine on the northeast facing slope to the east of the western boundary of the project site. Landslide 21 is entirely located within Parcel A and
coalesces with Landslide 22, at their respective toes just above Paradise Drive. Based upon the previously mapped limits of Landslide 21, this slide has an approximate surface area of over 70,000 square feet. Topographic relief for the landslide is about 300 feet, from the top of the slide to where it joins Landslide 22. Miller Pacific recommends that Landslide 21 be improved through the use of a debris catchment structure with a fence on piers to be located near Paradise Drive (see Exhibit 5.4-3). They estimate that improvement of this landslide would involve grading quantities on the order of ten cubic yards.

Landslide 22

Landslide 22 is located north of Landslide 21 and extends from offsite on the Tiburon Uplands Nature Preserve onto the project site and down to the east, to Paradise Drive. Landslide 22 is located entirely within Parcel A and coalesces with Landslide 21, at their respective toes just above Paradise Drive. Based upon the previously mapped limits of Landslide 22, this slide has an on-site surface area of about 40,000 square feet. On-site topographic relief for the landslide is on the order of about 170 feet, from the top of the slide to where it joins Landslide 22. Miller Pacific recommends that Landslide 22 be improved through the use of a debris catchment structure with a fence on piers to be located near Paradise Drive (see Exhibit 5.4-3). They estimate that improvement of this landslide would involve grading quantities on the order of ten cubic yards.

Landslide 23

Landslide 23 is located on the east facing slope at the extreme north end of the project site. Landslide 23 extends upslope about 100 feet from Paradise Drive. Landslide 23 is located entirely within Parcel A. Based upon the previously mapped limits of Landslide 23, this slide has a surface area of about 14,400 square feet. Miller Pacific recommends that Landslide 23 be improved through the use of a combination of subsurface drains and a debris catchment structure (see Exhibit 5.4-3). The catchment structure is proposed to consist of a debris fence on piers to be located near Paradise Drive. They estimate that improvement of this landslide would involve grading quantities on the order of 53 cubic yards.

Landslides 26 and 27

Landslides 26 and 27 are connected, forming one small coalescing slide on the north facing slope at the northeast corner of the site. The landslides lie completely within the limits of Lot 31. Landslides 26 and 27 extend upslope about 150 feet from Paradise Drive. The landslides extend into the proposed building site for Lot 31. Based upon the previously mapped limits of these landslides, they have a combined surface area of about 10,000 square feet. Miller Pacific recommends that Landslides 26 and 27 be repaired through the use of a series of retaining structures and subsurface drainage (see Exhibit 5.4-3). They estimate that repairing of these slides would involve grading quantities on the order of 70 cubic yards.

Landslide 38

Landslide 38 is on the east facing slope, just below the Lands of Keil. Landslide 38 is located entirely within Parcel A. This landslide has an approximate surface area of about 25,000 square feet. Landslide 38 is not located near any of the proposed building sites or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed building sites at least 100 feet away (see Exhibit 5.4-3). Because no repair or improvements are contemplated for Landslide 38, grading is not anticipated.
5.4 Geology and Soils

Landslide 39

Landslide 39 is a small debris flow landslide in a south facing ravine, southeast of Landslide 16. Landslide 39 is located entirely within Parcel A. This landslide has an approximate surface area of 3,300 square feet. Landslide 39 is not located near any of the proposed building sites or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed building sites at least 100 feet away (see Exhibit 5.4-3). Because no repair or improvements are contemplated for Landslide 39, grading is not anticipated.

Landslide 40

Landslide 40 is located on the east facing slope towards the north end of the property. This landslide lies within the limits of proposed Lots 27 and 28. Landslide 40 extends upslope about 75 feet from Paradise Drive. The landslide extends into the proposed building sites for Lots 27 and 28. Based upon the previously mapped limit of this landslide, it has an approximate surface area of 20,000 square feet. Miller Pacific recommends that Landslide 40 be repaired through the use of a series of retaining structures and subsurface drainage (see Exhibit 5.4-3). They estimate that repairing of this slide would involve grading quantities on the order of 110 cubic yards.

PROPOSED LOT GRADING

Conceptual grading plans have been prepared for each of the 43 lots. The following is a brief discussion of proposed grading for each lot plus parcels A, B, C, and the Lands of Keil parcel.

Exhibit 3.0-10 provides a summary of the lot grading quantities based on the conceptual grading plans for each of the 43 proposed lots.

Lot 1

The grading for Lot 1 would involve minor removal and recompaction of the shallow colluvial soils within the proposed building site and the proposed driveway.

Lot 2

The grading for Lot 2 would consist of nominal cut / fill grading to enable construction of the proposed building site and driveway.

Lot 3

The grading for Lot 3 would be limited to the cut / fill grading to remove and recompact any loose colluvial soils and to enable construction of the proposed building site and driveway.

Lot 4

The grading for Lot 4 would be limited to nominal cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed building site and driveway.

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68 Lot Specific Conceptual Grading Plans, 43 sheets (G-1 to G-43), project applicant, January 2009.
Lot 5

The grading for Lot 5 would be limited to nominal cut / fill grading to facilitate construction of the proposed building site and driveway.

Lot 6

The grading for Lot 6 would be limited to nominal cut / fill grading to enable construction of the proposed building site and driveway.

Lot 7

The grading for Lot 7 would be limited to nominal cut / fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed building site and driveway.

Lot 8

The grading for Lot 8 would be limited to the cut / fill grading to remove and recompact any loose colluvial soils and to enable construction of the proposed building site and driveway. Additionally, Miller Pacific recommends improvement of Landslide 1, which would involve minor grading and construction.

Lot 9

The grading for Lot 9 would involve grading to remove and recompact the material present to stabilize Landslide 2 which is present on this lot. Minor cut / fill grading would also be necessary to facilitate construction of the proposed building site and driveway.

Lot 10

The grading for Lot 10 would involve grading to remove and recompact the loose colluvial soils and the slide material present to stabilize Landslide 11 which extends over much of this lot. Minor cut / fill grading would also be necessary to enable construction of the proposed building site and the road along the lot’s southern boundary.

Lot 11

The earth work for Lot 11 would involve grading to remove and recompact the loose colluvial soils and the slide material present within 100 feet of a proposed building site or public improvement along the lot’s southern boundary.

Lot 12

The grading for Lot 12 would be anticipated to involve cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and adjacent roadway. It is also proposed to excavate to install subsurface drainage to improve Landslide 11, which underlies much of this lot.

Lot 13

The grading for Lot 13 would be limited to cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and adjacent
roadway. It is also proposed to excavate to install subsurface drainage to improve Landslide 11, which underlies much of this lot.

Lot 14
The grading for Lot 14 would be limited to cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and adjacent roadway to the south. It is also proposed to excavate to install subsurface drainage to improve Landslide 11, which underlies much of this lot.

Lot 15
The grading for Lot 15 would be limited to cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and adjacent roadway to the west. It is also proposed to excavate to install subsurface drainage to improve Landslide 11, which underlies much of this lot.

Lot 16
The grading for Lot 16 would involve cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and adjacent roadway to the north. It is also proposed to excavate to install pier and grade beams and subsurface drainage to improve Landslide 3, which encroaches onto this lot.

Lot 17
The grading for Lot 17 would include cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and adjacent roadway to the north. It is also proposed to excavate to install subsurface drainage and pier and grade beam walls to improve Landslide 3, which encroaches onto this lot.

Lot 18
The grading for Lot 18 would include cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and adjacent roadway to the north. It is also proposed to install subsurface drainage and a buried pile wall to improve Landslide 3, which encroaches onto this lot.

Lot 19
The grading for Lot 19 would include cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and adjacent roadway to the north. It is also proposed to remove and recompact the landslide materials and to excavate and add subdrainage to improve Landslide 3, which encroaches onto this lot.

Lot 20
The grading for Lot 20 would involve minor removal and recompaction of the shallow colluvial soils within the proposed building site and the adjacent driveway and roads.
Lot 21

The grading for Lot 21 would include cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and access driveway. It is also proposed to remove and recompact the slide material from Landslide 6, which lies entirely within this lot.

Lot 22

The grading for Lot 22 would include cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and access driveway. It is also proposed to remove and recompact the slide material from Landslide 7, which lies entirely within this lot.

Lot 23

The grading for Lot 23 would include cut / fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed building site and access driveway. It is also proposed to remove and recompact the slide material from Landslide 8 and to excavate and install subsurface drainage and retention structures, to the area of Landslide 9, which both encroach onto this lot.

Lot 24

The grading for Lot 24 would involve minor cut and / or fills of the shallow soils necessary to construct the proposed building site and the roadway to the south.

Lot 25

The grading for Lot 25 would be limited to nominal cut / fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed building site and road to the north.

Lot 26

The grading for Lot 26 would include cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed building site and roadway to the north. It is also proposed to excavate and install subdrains to improve the stability of the slide material from Landslide 18, which slightly encroaches onto the southeast corner of this lot.

Lot 27

The grading for Lot 27 would include cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed building site and roadway to the north. It is also proposed to excavate and install subdrains to improve the stability of the slide material from Landslides 18 and 40, which encroach onto this lot.

Lot 28

The grading for Lot 28 would include cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed building site and roadway to the north. It is also proposed to excavate and install subdrains and retaining structures or shear keys, to improve the stability of the slide material from Landslide 40, which encroaches onto this lot.
Lot 29
The grading for Lot 29 would be limited to nominal cut/fill grading to facilitate construction of the proposed building site and driveway.

Lot 30
The grading for Lot 30 would be limited to nominal cut/fill grading to facilitate construction of the proposed building site and driveway.

Lot 31
The grading for Lot 31 would include cut/fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed building site and driveway to the south. It is also proposed to excavate and install subdrains to improve the stability and completely stabilize the slide material from Landslides 26 and 27, which encroach onto this lot.

Lot 32
The grading for Lot 32 would be limited to nominal cut/fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed building site and roadway to the south.

Lot 33
The grading for Lot 33 would be limited to nominal cut/fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed building site and roadway to the south.

Lot 34
The grading for Lot 34 would be limited to nominal cut/fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed building site and roadway to the south.

Lot 35
The grading for Lot 35 would be limited to nominal cut/fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed building site and roadway to the east.

Lot 36
The grading for Lot 36 would be limited to nominal cut/fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed building sites and roadway to the east.

Lot 37
The grading for Lot 37 would include cut/fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed building site and driveway to the south. It is also
proposed to remove and recompact the landslide material to repair Landslide 2, which slightly encroaches onto this lot.

**Lot 38**

The grading for Lot 38 would be limited to nominal cut / fill grading to remove and recompact existing loose soils to allow construction of the proposed building site and roadway to the northeast.

**Lot 39**

The grading for Lot 39 would be limited to nominal cut / fill grading to remove and recompact existing loose residual and colluvial soils to allow construction of the proposed building site and roadway to the west.

**Lot 40**

The grading for Lot 40 would involve grading to remove and recompact the loose colluvial soils and the slide material present to stabilize Landslide 13, which is present on this lot. Minor cut / fill grading would also be necessary to allow construction of the proposed building site and the roadway along the lot’s western boundary.

**Lot 41**

The grading for Lot 41 would involve grading to remove and recompact the loose colluvial soils and the slide material present to stabilize Landslide 13, which is present on this lot. Minor cut / fill grading would also be necessary to allow construction of the proposed building site and the roadway along the lot’s western boundary. 69

**Lot 42**

The grading for Lot 42 would involve grading to remove and recompact the loose colluvial soils and the slide material to stabilize the upper portion of Landslide 11, which is present on this lot. Minor cut / fill grading would also be necessary to allow construction of the proposed building site and the roadway along the lot’s western boundary.

**Lot 43**

The grading for Lot 43 would involve grading to remove and recompact the loose colluvial soils and the slide material present to stabilize the upper portion of Landslide 11 which extends over much of this lot. Minor cut / fill grading would also be necessary to enable construction of the proposed building site and the road along the lot’s western boundary.

**Parcel A**

Minor cut / fill grading in previously mentioned areas of removal and recompaction, where landslides encroach into proposed building sites and roads, the excavation and installation of subdrains has also been recommended in several places in this open space area.

69 Ibid.
Parcel B
No grading is proposed within the limits of this parcel.

Parcel C
The repair for Parcel C would involve the addition of a retention structure and subsurface drainage to stabilize Landslide 16, which encroaches onto the southeast portion of this parcel. Minor cut / fill grading would also be necessary to allow construction of the proposed construction access roadway along the parcel’s eastern boundary.

Lands of Keil
No grading is proposed within the limits of this parcel.

NO OR LESS-THEL-SIGNIFICANT IMPACTS
Based on the findings of the analyses completed as a part of this Draft EIR it has been determined that the proposed 2008 Easton Point Residential Development would have either no impact or less-than-significant impacts for the following significance criteria.

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.

The site is not located within an Alquist-Priolo earthquake fault zone (EFZ), and no active fault traces are mapped across the site or in the nearby vicinity. As reported in its geotechnical report, Miller Pacific Engineering Group found no evidence of active faulting on the project site. Therefore, no impact would be anticipated to occur due to ground surface fault rupture.

- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water.

The proposed project would connect to the existing sanitary sewer system managed by Sanitary District No. 5. Use of septic tanks or alternative wastewater disposal systems is not proposed as part of the proposed project. Therefore, no impact would occur.

- Be located in a Mineral Resource Zone identified by the California Department of Mines and Geology.

The project site is not within a State designated Mineral Resource Zone.
5.4 Geology and Soils
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IMPACT ANALYSIS

Impact 5.4-1 Landsliding

Numerous landslides are present on the project site, some of which are located in or within 100 feet of proposed building sites and public improvements. Other landslides are located in proposed open space areas and on portions of lots over 100 feet from existing landslides. If all of the (dormant or active; Risk Levels A and B) landslides are not improved, mitigated or avoided, some of the landslides could reactivate, causing a potential risk to life and property. This would be a significant impact.

The most significant potential geologic hazard to development of the site is landsliding. Landslides of various types blanket much of the site, both in and adjacent to areas proposed for development (see Exhibit 5.4-1).

If the portions of landslides that encroach onto proposed building sites and proposed public improvements are not adequately mitigated, landslides could reactivate, possibly causing bodily harm and/or property damage. Landslides that threaten the proposed development and improvements include landslides 2, 3, 6, 7, 8, 11, 13, 15, 16, 19, 26, 27, and 40. Except for landslides 13 and 15 each of these landslides has been designated as Risk Level A by Miller Pacific. Landslides 13 and 15 have been designated as Risk Level B (see Exhibit 5.4-2).

As discussed above, the applicant’s geotechnical consultant proposes to protect the proposed lots and related public improvements by complete repair of the portions of landslides that are located within 100 feet of a proposed building site or proposed public improvement. The repaired landslides are to have minimum factors of safety of 1.5 for static and 1.0 for pseudo-static conditions, respectively. It is the applicant’s geotechnical consultant’s professional opinion that the proposed landslide mitigation plan would provide adequate setback or stability improvements that would reasonably protect the planned structures. They also conclude that implementation of the landslide mitigation plan would significantly improve the stability of existing landslides near the proposed building sites. Miller Pacific further concludes that the stability of the existing landslides within undeveloped or open space areas would remain the same or be marginally improved.

On a site blanketed by landslides, Miller Pacific must consider what they feel to be an acceptable risk. While the applicant’s geotechnical consultant’s conceptual landslide stabilization plan would improve the stability of much of the site, it would also leave portions of the site vulnerable to future slope failures. Snyder & Wilson Engineering’s (the EIR geologists) experience has shown that the standard-of-care will drop to the lowest level that the geotechnical consultant, or more importantly, the reviewing agency will allow. Miller Pacific proposes to improve the stability of slides in areas beyond 100 feet from a proposed building site and not to repair them. However, the existing, poor inherent slope stability in some areas related to the site’s landslide-affected areas, is significant. These existing instabilities may exist in non-developed areas after the proposed project is completed. The applicant’s geotechnical consultant proposes to avoid or marginally improve solitary landslides and portions of slides that are over 100 feet from proposed building sites. Since existing slides more than 100 feet away from proposed building sites would not be completely repaired, there is the potential for some of the landslide material that was avoided or marginally improved to reactivate. Because this is an existing condition, some landslide hazard may remain on-site even after repairs are completed consistent with Marin County’s landslide mitigation policy and Miller Pacific’s landslide mitigation policy for this project. An example of this situation would be the lower portion of Landslide 11 that is present along the west side of Paradise Drive.

For the sake of simplicity, this landslide complex was lumped by the applicant’s geotechnical consultant, into one landslide, Landslide 11. A coalescing landslide complex, Landslide 11 consists of
a deep ancient landslide that has spawned secondary, shallow landslides on top of it and along its lateral margins. Therefore, the landslide deposits could theoretically fail by either deep-seated or shallow mechanisms, damaging and / or blocking Paradise Drive. This landslide has been classified, based upon their criteria, as active, Risk Level A, by Miller Pacific. This affirms that the applicant’s geotechnical consultant found visible indications of relative youth (based on Miller Pacific’s criteria) with respect to the upper, shallow, layer of the slide complex. Past stability calculations by Kleinfelder demonstrated that the entire lower portion of Landslide 11 would fail and yield at least four feet into Paradise Drive in the event of a moderate to large earthquake. 70 If this were to occur, Paradise Drive would be blocked for an indeterminate amount of time and likely suffer damage. Due to its extensive size, it is also possible that Landslide 11 extends further down the slope and under Paradise Drive. If that scenario is correct, then the extent of seismic damage to the roadway could potentially be much greater.

It must, however, be reiterated that the poor stability of Landslide 11 (and similar site landslides) is an existing condition that will either remain unaffected or be slightly improved by Miller Pacific’s conceptual landslide stabilization plan. For Landslide 11, it is proposed to add two subdrains and construct two debris fences (silt fence or catchment structure) along the upslope side of Paradise Drive. However, it is not planned to extend the debris fence all the way across the toe of the slide (see Exhibit 5.4-3). Debris or silt fences are intended to protect areas below them by containing the upper, few feet of materials that wash down from above. However, as Landslide 11 is 35 to 100 feet deep, a debris fence would likely have little or no effect on the stability of a moderate or deep-seated slide. Also planned is the addition of two shallow subdrains to attempt to intercept some of the subsurface water that may accumulate. Similarly, these drains would not likely have a calculable effect on landslide stability, which will probably stay the same, or be only slightly improved.

There is a high potential for reactivation of landslides or secondary failures in loose soils or landslide materials, if engineered improvements and / or mitigation measures, that yield adequate factors of safety, are not applied. Kleinfelder calculated the deep-seated stability of Landslide 11 and determined that it would likely fail in a moderate to large earthquake. Otherwise, Snyder & Wilson Engineering (the EIR geologists) understand that neither shallow nor deep-seated stability analyses were performed on-site by Miller Pacific.

The applicant’s geotechnical consultant, Miller Pacific, estimates that approximately 53,156 cubic yards of material would be removed and replaced during grading for landslide stabilization and related improvements (see Exhibit 5.4-2). Without obtaining the level of stability required for the proposed building sites and improvement areas, it is possible that the long-term stability of the portions of the landslides that are not slated for repair could not be assured. If the hazard of landsliding is not properly mitigated or the slope stability thoroughly improved, it could have a significant impact on the proposed development and public improvements, adjacent properties and Paradise Drive. Reactivation of landslides has been a problem in much of Marin County when landslide hazards were not significantly improved or completely mitigated.

The proposed Preliminary Grading Plan and PDP rely on a concept of minimal grading and the use of retaining structures to protect building sites (including the building envelopes and improvements). 71 This conceptual landslide stabilization plan, prepared by the applicant’s geotechnical consultant, is intended to increase the stability of landslides located within 100 feet of a proposed building site or

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71 Ibid.
public improvement. Miller Pacific’s landslide stabilization plan calls for increasing the stability of these slides to 1.5 for static and 1.0 for pseudo-static conditions, respectively. They conclude that these repair measures (from their conceptual landslide stabilization plan), would provide the factors of safety required to provide safe and stable building sites.

In some areas, where the landslides are planned to be improved or avoided (not repaired), the proposed conceptual landslide stabilization plan would not necessarily prevent future landsliding in areas of existing geologic instability, outside of proposed development areas. Complete repair in non-building areas is not required by Marin County’s landslide mitigation policy or proposed in Miller Pacific’s conceptual landslide stabilization plan. If portions of these already active slides reactivate, they could potentially affect open space, Paradise Drive, off-site properties, on-site proposed roads, and other parts of proposed lots themselves. If not significantly improved or mitigated, portions of landslides could fail periodically during heavy rains and / or seismic events. It is conceivable that partial grading could also affect the stability of existing landslides adversely, if their factors of safety are not improved to the applicant’s geotechnical consultant’s standards for stable slide areas, which is 1.5 for static and 1.0 for pseudo-static (seismic) conditions, respectively. Minimal grading is intended to blend hillside development into the surrounding terrain and minimize the corridor of disturbance.

A lot-specific discussion of the primary on-site landslide, Landslide 11 is provided below. Because of the existing, inherent instability of the site’s earth materials and the limited repairs proposed in the applicant’s stabilization plan, there is the potential for future slippage in areas already subject to active sliding.

A coalescing landslide complex, Landslide 11 consists of a deep ancient landslide that has spawned secondary, shallow landslides on top of it and along its lateral margins. Currently landslide 11 is classified by Miller Pacific as Active. This landslide extends up into nine lots which are slated to be repaired within 100 feet of the proposed building sites. Proposed improvements to unrepaired areas would be limited to the addition of two subdrains and two debris fences. It is not known how these proposed improvements would affect the stability of the non-repaired portions of the landslide. However, due to the large size and depth of Landslide 11, their effect on slope stability would probably be negligible. Therefore, the lower portions of the landslide deposits could theoretically fail by either deep-seated or shallow mechanisms. If this were to occur, it could damage and / or block Paradise Drive. Additionally, if this landslide moves again it could damage the unrepaired portions of the proposed Lots 10 through 15, 42, and 43 causing the land to fail downslope and potentially onto adjacent lots. However, it must be noted that this potential geologic hazard of landsliding in non-developed areas was present prior to the contemplation of this project. Therefore, the Miller Pacific proposed conceptual stabilization plan would adhere to Marin County’s landslide mitigation policy. Consistent with County policy, Miller Pacific recommend’s improvement or avoidance in areas not planned for development. Implementation of the conceptual landslide stabilization plan would produce a site stability that would be the same or better than that prior to development.

Snyder & Wilson Engineering’s (the EIR geologists) experience has shown that when only portions of landslides underlying lots are stabilized, the remaining portions of the lots can still fail. This is also true of landslides that were avoided, but not repaired, in open space areas. Slides crossing lot lines or failing into open space areas can trigger lawsuits and often can leave scars on the slope that must be repaired.

Summary of Impact

Repair and improvement methods proposed by Miller Pacific include additional grading, retaining walls (or subsurface pile walls or shear keys), debris fences, rip-rap, and subdrains. Included within
the mitigative measures proposed is the requirement to repair any landslide within 100 feet of a proposed building site or public improvement. Other landslide areas are to be avoided or improved. The stability of the landslides left in place has not been determined and, therefore, the long-term performance cannot be definitively predicted. Based upon the history and past poor performance of unrepaired landslides on the Tiburon Peninsula, future landsliding in areas of the project site not destined for complete repair cannot be ruled out. It is, however, noted that since site instability is an existing condition, and not a direct impact of the proposed project, neither CEQA, the Marin County landslide mitigation policy, nor the Miller Pacific policy developed for this project would require that landslides outside the area of potential project impact be completely repaired.

**Mitigation Measure 5.4-1** The following mitigation measure would be required to mitigate significant impacts related to landsliding:

Prior to the issuance of any grading permit a design level comprehensive geotechnical report shall be prepared and submitted to Marin County CDA-Building & Safety Division or Marin County Department of Public Works. The geotechnical report shall include an engineering geologic and geotechnical investigation on a lot-by-lot basis before development of roadways and utilities and within proposed building sites of each individual lot. The report shall include a comprehensive design-level grading plan including a landslide stabilization program on all lots and a long-term maintenance program for the stabilization program. The repair program shall be implemented by the applicant. Furthermore:

- All landslides shall be eliminated, repaired, improved, or avoided in accordance with Marin County landslide mitigation policy and the landslide criteria and mitigation policy established for this project by Miller Pacific Engineering Group.
- For each landslide present on the project site the limits shall be verified.
- Landslide 9 shall be completely repaired in accordance with Miller Pacific’s criteria for landslide repair. Landslide 9 is less than 100 feet from the proposed building site for Lot 23. This landslide is only scheduled for improvement. This would be inconsistent with the project’s landslide mitigation policy. Stabilizing this small landslide would eliminate the inconsistencies present in the conceptual repair plan.
- The geotechnical report shall include stability calculations for landslides or portions of landslides within 100 feet of the building sites or public improvements to confirm that proposed repair methods would provide a factor of safety of at least 1.5 for static conditions and greater than 1.0 for pseudo-static (seismic conditions).
- For landslides that shall not be repaired or improved it shall be documented that the proposed project will not have an adverse impact on the existing landslide and that the project will either improve or not further exacerbate the landslide.
- A long-term maintenance program that provides for periodic inspections and maintenance of the recommended landslide stabilization program during the life of the project shall be included. The maintenance program shall provide for:
  - Periodic geologic inspections
  - Monitoring of geotechnical and hydrologic mitigation measures to assure effectiveness.
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- A schedule for routine cleaning and maintenance of drainage devices.
- Provisions to provide recommendations for additional erosion control or mitigation of any unforeseen hazards which develop in the future.
- Provision for a regular reporting schedule.
- Identification of an entity responsible to implement the maintenance program.

Significance after Mitigation Implementing the recommendations of the applicant’s geotechnical consultant and mitigation measures that call for future stabilization recommendations based on forthcoming detailed lot-specific investigations would provide landslide repair techniques capable of reducing potential slope instability hazards to building sites and public improvements to a less-than-significant level.

Responsibility and Monitoring The applicant's geotechnical consultant would be responsible for conducting subsurface investigations, determining the proposed approach(es) to satisfy required improvement in stability, and preparing a comprehensive geotechnical report including an analysis and recommendations on the grading plan(s), and the applicant would be responsible for funding an independent peer review, if required by the County. The applicant also would be responsible for constructing drainage improvements, grading and other repairs identified by the comprehensive grading plan in accordance with County guidelines. The applicant’s geotechnical consultant would monitor these measures. The County may retain the assistance of an independent geologist whose review would be funded by the applicant.

Impact 5.4-2 Slope Stability Unrepaired areas of colluvial and landslide deposits could erode or fail locally until they reach equilibrium. This would be a significant impact.

Because of the low shear strength of the weathered zone in the site's fractured bedrock and the existence of landslides and colluvial deposits mantling such bedrock, the potential instability of cut, fill, and natural slopes should be examined and re-evaluated once exposed by the grading operations. The applicant's geologist recommends slopes to be at a gradient of 2:1 (horizontal to vertical) or less. This gradient is in accordance with the Unified Building Code (UBC) and has worked fairly effectively in Marin County for fill slopes less than 30 feet high. Miller Pacific has avoided cut slopes in mélange areas where the bedrock is highly weathered and has not performed as well. This is prudent because, while many of the Franciscan and related bedrock units have moderate to high strengths when fresh, their relative strengths often decrease to lower levels once exposed to the elements for a few years and allowed to swell. It is particularly important to control water in landslide areas where concentrated runoff could lower stability of the existing landslides. These areas also are prone to increased erosion and surficial instability because of their low long-term strength when saturated. Thus, there is a significant possibility of erosion on graded slopes if proper drainage facilities are not provided.

Mitigation Measure 5.4-2 The applicant and individual lot owners and their respective geotechnical consultants shall implement the following measures in order to mitigate the impacts of low shear strength of some fill soil materials and possible erosion of some slopes.

- Evaluate the strength and other soil index properties of the on-site earth units. In areas that require removal and replacement to create an earth filled buttress, within 100 feet of a proposed
building site or public improvement, excavate and replace any loose colluvium or other earth units encountered with certified, engineered compacted fill soil and add proper subdrainage.

- Design drainage facilities, on cut and fill slopes, to include terrace drains every 30 feet of vertical height on all slopes. The terrace drains shall have a minimum flowline gradient of six percent to make them self-cleaning (a minimal tenet of the Uniform Building Code). They also shall be fitted with downdrains every 150 linear feet of terrace length to allow for quick drainage (also UBC).

**Significance after Mitigation**  Implementation of Mitigation Measure 5.4-2 would reduce the potential impact of shallow soil deposits to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for implementing this measure when preparing the site for landslide repair and road construction and, by stipulation in the CC&Rs that individual lot owners would be required to implement the measure when developing their lots. The County’s Building and Safety Division would ensure compliance by the respective Geotechnical consultants prior to the issuance of building or grading permits.

**Impact 5.4-3  Seismicity**

Strong seismic shaking is expected to occur on the site some time during the effective “life” of development. This would be a significant impact.

Because of the proximity of the site to the Hayward, San Andreas, Rodgers Creek, and other active faults, there is a high probability that the site will experience strong ground shaking during the lifetime of any proposed structures. Peak ground shaking of 0.40g is possible from the nearby Hayward or Rodgers Creek faults during the life of development. Ground shaking also could induce landsliding. This is especially true for Landslide 11. This landslide has been calculated by Kleinfelder to yield laterally three to four feet in a major earthquake. Pseudo-static analyses of seismic loading of hillslopes, landslides, and embankments need not exceed 0.15g.  

**Mitigation Measure 5.4-3**  All site development shall comply with all applicable seismic design provisions of the most recent County-adopted Uniform Building Code criteria for structures in Seismic Zone 4.

**Significance after Mitigation**  Implementation of Mitigation Measure 5.4-3 would reduce the impact of seismically induced ground shaking to meet building code criteria. The basic requirement is that new structures should withstand ground movement from a minor earthquake without damage; from a moderate earthquake without structural damage; and from a major earthquake without collapse. It is acknowledged that seismic ground shaking impacts cannot be eliminated even with site-specific geotechnical investigations and building requirements. Exposure to seismic hazards is a generally accepted part of living in the San Francisco Bay Area and, therefore, implementation of Mitigation Measure 5.4-3 would reduce seismic ground shaking impacts to a less-than-significant level.

**Responsibility and Monitoring**  The applicant would be responsible for implementing this measure when building and installing infrastructure to support residential lots and for requiring compliance by individual lot owners through inclusion of this measure in CC&Rs. The County’s Building and Safety

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Division would be responsible for monitoring this measure when reviewing building permit applications and inspecting construction.

**Impact 5.4-4  Groundwater**

The conceptual landslide stabilization plan is intended to increase the stability of existing on-site landslides through proposed mitigative measures such as earth fill buttresses, buried pier and grade beam walls, and subdrains. All of these methods of landslide improvement have the potential to convert groundwater to surface water. By intercepting groundwater emanating from the fractured bedrock on the ridges and perched within colluvial or landslide deposits, subsurface water recharge could be significantly reduced. This could limit the quantity of groundwater available to the seeps, springs (including Keil Spring), and the seasonal pond. This would be a less-than-significant geologic impact.

Keil Spring and the other spring based water supplies rely on infiltration and recharge through fractured rock on the ridges above them and to a lesser extent, perched water in colluvial or landslide deposits. While this groundwater is beneficial to Keil Spring and the other springs, it conversely, can easily lower the stability of existing landslides. Therefore, by increasing the stability of the landslide deposits through dewatering with subdrains, the intercepted water is more quickly converted to surface water, thereby reducing flow quantities.

Hydrologic impacts associated with a reduction in groundwater recharge are discussed in Section 5.5 Hydrology and Water Quality (see Impacts 5.5-4 Groundwater Recharge and On-site Hydrology and 5.5-5 Groundwater Recharge and Off-Site Hydrology.)

**Mitigation Measure 5.4-4**  No mitigation would be required.

**Impact 5.4-5  Artificial Fill Areas**

New construction on existing artificial fill, if present, could settle unevenly and be damaged or could stimulate or accelerate erosion. This would be a significant impact.

Areas of existing artificial fill appear to be limited to access roads, the Paradise Water Tank, and along site boundaries. If such materials are present in the vicinity of proposed grading, they could settle non-uniformly or be subject to erosion.  

**Mitigation Measure 5.4-5**  In order to mitigate this impact, the applicant shall implement the following measures and incorporate them in the CC&Rs for implementation by individual lot owners and lot cluster developers in the future:

- Before preparing site-specific designs and receiving building permits, conduct field investigations to determine the presence and limits of such materials in the vicinity of parts of the site proposed for development.
- After receiving grading or site alteration permits from the County, remove and recompact artificial fill located in or adjacent to areas of proposed grading under the observation and testing of a registered geotechnical engineer.

**Significance after Mitigation**  This measure would reduce potential impacts to a less-than-significant level.

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73 See Section 5.5 Hydrology and Water Quality Impact 5.5-3 for a discussion of on-site erosion impacts.
**Responsibility and Monitoring** The applicant would be responsible for implementing this measure when building and installing infrastructure to support residential lots and for requiring compliance by individual lot owners through inclusion of this measure in CC&Rs. The County’s Building and Safety Division would be responsible for monitoring this measure when reviewing building permit applications and inspecting construction.

**Impact 5.4-6 Expansive Soils**

Development (structures, roads, utilities) located on expansive soils could be damaged by dislocations caused by cyclic shrinking and swelling. This would be a significant impact.

Laboratory testing indicates that on-site soils have a moderate to high shrink-swell potential. This shrink-swell phenomenon more commonly is referred to as expansive soils and is most evident in cohesive soils with high clay content.

Expansive soils are naturally prone to large volume changes through the absorption of pore water. The physical manifestations of such moisture changes most often are expansion or swelling during the winter and subsequent shrinkage due to drying (desiccation) in the summer. This cyclic volume change can exert large forces on nearby structures, causing damage to concrete slabs and foundation elements and cosmetic damage to interior and exterior wall surfaces. The site’s soil loams are soil materials which, by definition, contain seven to 27 percent clay particles. Thus, there should be some forethought before development on expansive soils.

**Mitigation Measure 5.4-6** The applicant and individual lot owners and their respective geotechnical consultants shall implement the following measures to reduce impacts of the site's expansive soils on development to a less-than-significant level:

- Perform plasticity index or expansion index testing after grading to determine the specific shrink-swell potential for development sites as deemed appropriate by the respective geotechnical engineer(s).

- Identify site-specific mitigation which accounts for conditions present at proposed development sites. Typical measures to treat expansive soils shall include the following (or their equivalent):
  - Pre-saturating fill soils and placing wet fill soils (above optimum moisture content) to expand the soil, thereby reducing potential damage to concrete by allowing room for future shrink/swell movement of the soils.
  - Placing a non-expansive imported soil in the upper part of building sites.
  - Burying expansive soils deep in fills.
  - Treating soil with lime.
  - Mixing expansive soils with less expansive soils.
  - Designing foundation footing systems to incorporate measured variations of soil swell with effective confinement (dead weight).

- Design residential development on individual lots to account for each site's expansive soils. Measures typically incorporated in building design shall include (or their equivalent):
  - Strengthening foundations (beam).

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74 Geologic and Geotechnical Investigation, Easton Point Development, op. cit.
- Using suspended wood floors, drilled pier and grade-beam foundations, floating slabs, or pre-stressed (post-tensioned) slabs on-grade.
- Treating with chemicals.
- Combining two or more of these techniques.

**Significance after Mitigation** Implementation of Mitigation Measure 5.4-6 would reduce the impacts of expansive soils to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for implementing this measure when building roads and installing utilities. The applicant also would be responsible for requiring individual lot owners to implement this measure when developing their lots by incorporating the measure in the CC&Rs. The County's Building and Safety Division would monitor implementation when reviewing site alteration and building permit applications.
5.5 HYDROLOGY AND WATER QUALITY
INTRODUCTION

As discussed in Section 1.0 Introduction two previous Draft EIRs (the 1996 Draft EIR and the 2001 Draft EIR) were prepared to evaluate potential environmental impacts of residential development at the Easton Point project site. The 2008 Easton Point Residential Development project differs in some respects from the projects evaluated in the 1996 and 2001 Draft EIRs. One difference is the design of the project’s storm water drainage system. The applicant is proposing on-site detention of portions of the post-project stormwater runoff through the use of underground storage facilities. The storage facilities would utilize orifice-type hydraulic controls to release detained stormwater at pre-project discharge rates. The stormwater detention facilities would maintain pre-project ten-year peak flow rates under post-project land use conditions for the ten-year to 100-year design rainstorms. The purpose of the on-site storm water detention facilities is to eliminate the need for any downstream drainage system modifications (i.e. retrofitting of culverts under Paradise Drive).

During the public scoping period numerous comments regarding the project’s impacts to hydrology and water quality were received by the County. Specifically, public comments requested that the EIR assess hydrologic and water quality impacts to: the Lands of Keil spring, Keil Pond, Keil Cove, and Railroad Marsh.

Site visits were conducted by Clearwater Hydrology (the EIR hydrologist) to assess the existing site conditions at the time of EIR preparation. Site visits were conducted for the present EIR and the two prior Draft EIRs. Site visits have occurred in April 1995, October/November 2000, and March/May 2009.

REGIONAL HYDROLOGY

The project site covers 110 acres of land located at the eastern tip of the Tiburon Peninsula and separated from San Francisco Bay by Paradise Drive. Exhibit 5.5-1 illustrates site topography, hydrology, and the local Bay shoreline. Most site runoff drains to the east under Paradise Drive and through shoreline properties to one of three receiving waterbodies, including Keil Cove (an inlet on the western shore of Raccoon Strait), Keil Pond (a freshwater pond on the Keil property at 2600 Paradise Drive), or San Francisco Bay. Numerous small drainages and ravines discharge directly onto the shoreline of San Francisco Bay between Bluff Point and Point Chauncey to the northwest. Exhibit 5.5-1 designates the boundaries of the on-site watersheds. The on-site watersheds are designated as A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, and AA.

In the southern portion of the project site, the drainageway in Watershed C (see Exhibit 5.5-1) conveys runoff generated over the southwest-facing part of the site to the southwest, and another series of small south-facing areas (Watersheds B and D) drains overland to the south in the vicinity of Ridge Road and Mountain View Drive. The drainageway in Watershed C eventually conveys its stormwater runoff beneath Mar West Street and into Railroad Marsh, a freshwater marsh north of Tiburon.
Exhibit 5.5-1
Local Hydrology

Boulevard. Stormwater accumulating in Railroad Marsh eventually overflows and continues east-southeast to an artificial holding pond, referred to as Tiburon Pond. A gated culvert outlet discharges pond outflow into San Francisco Bay.

Elevations of site watersheds range from approximately 100 feet NGVD ¹ along Paradise Drive to about 600 feet at the crest of the north-south trending Ridgeline J (see Exhibit 4.0-1). Aside from the principal ridgeline formed by Ridgelines J and C and the spur ridges (Ridgelines G-H and D, E, F) located in the mid-elevation parts of the site, watershed slopes typically exceed 30 percent and reach 60 percent or higher.

Mean annual rainfall varies from 22 inches along Paradise Drive to 23 inches along Ridgeline J. Rainfall typically occurs during the winter rainy season which extends from November to April.

Significant, non-catastrophic creek flooding on site drainageways is minimal due to the steep slopes and incised channels which characterize the topography. Some flooding over Paradise Drive occurs periodically if road culverts become plugged with debris during major rainstorms. In addition, seasonal ponding occurs in the small pond and seeped areas, both located in the central east-facing “bowl” of the site. In extreme and infrequent cases, such as the January 1982 rainstorm, landslides or debris flows cause catastrophic flooding, downslope sedimentation, and culvert obstruction.

Watershed AA located in the northernmost portion of the project site is comprised of steep slopes with nearly all grades exceeding 40 percent. Watershed AA discharges into the Bay roughly midway between Bluff Point and Point Chauncey. A severe debris flow occurred in Watershed AA in January 1982. The scar left by the debris flow at the lower end of the canyon is now vegetated, primarily with high grass and brush.

Site soils are shallow and erodible where slopes are steep. Most of the ephemeral site drainages are incised, and evidence of gully headcuts is observable throughout the site. At the lower ends of the east-facing site drainageways above Paradise Drive, the channels are incised up to six to eight feet into the thicker soils of the lower colluvial terrace. Bedrock outcrops are typically visible in channel bottoms in the vicinity of the Paradise Drive culvert inlets.

The undeveloped site is covered by woodland, coastal scrub, and open grassland. The site is surrounded by low and very low density residential development (north, south, and east) and public open space (west).

The Keil property, located east of the site downhill of Paradise Drive, encompasses an extensive garden and a large, constructed landscape pond (Keil Pond) that are of local historical, horticultural, and biological significance. ² Keil Pond is the receiving water body for drainages emanating from the central bowl of the east-facing hillslopes of the project site. Earthen channels and culverts convey runoff discharged under Paradise Drive to sedimentation basins before discharge reaches the pond. An overflow weir controls water depths in the pond and allows for discharge to Keil Cove during normal rainfall years. ³

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¹ National Geodetic Vertical Datum (NGVD), equivalent to 1929 Mean Sea Level.

² The Lands of Keil spring, surrounded by the project site, is a separate parcel under the same ownership as the Keil property located downhill which contains Keil Pond and is bounded by Keil Cove. The spring is discussed further below.

LOCAL HYDROLOGY

The project site consists of moderately steep to steep hillslopes and flat to gently sloping ridgelines. Of the small ephemeral drainages that convey runoff from the site, all but one drain to the east or northeast. Exhibit 5.5-1 shows the site's hydrologic features, including watersheds, drainageways, seeps, springs, and seasonal ponds, and road culvert locations. Drainageways are indicated only where there is evidence of channel incision. Broad headwater swales and slope faces in smaller watersheds also exist on-site but typically convey runoff as sheet flow. Gully headcuts occur at the headward ends of most of the site’s mapped drainageways.

Water Quality

The quality of site runoff under existing watershed conditions is excellent. No urban use affects the site, and the only on-site road (the Marin Municipal Water District (MMWD) Paradise Water Tank service road) is little used. The site is relatively free of automotive pollutants, but small amounts enter road runoff along Paradise Drive. The quality of runoff entering the site’s east-facing drainageways can affect water quality in Keil Pond and Keil Cove. Water quality in the southwest drainageway (Watershed C) similarly could affect Railroad Marsh. However, water quality in the lower reaches of Watershed C, and more specifically Railroad Marsh, is likely to be compromised under existing conditions by runoff from the Tiburon Peninsula Club parking lots. The Tiburon Peninsula Club is located on Mar West Street and drains to the Marsh via curbs and a 40- to 50-foot long reach of rocked roadside ditch. No water quality data are available for either Keil Pond or Railroad Marsh, although the marsh and pond appear to be highly eutrophic when the source creeks begin to dry and temperatures warm. Sediment loading from the project site is variable and corresponds in magnitude to the intensity of storm rainfall, antecedent soil moisture conditions, and the occurrence of debris flows in the site’s watersheds. Thus, when intense rainfall occurs over a fully saturated watershed, substantial water and sediment discharge occurs. Sediment loads generated by channel erosion / incision also can be supplemented by local slump and / or slide failures in the upslope colluvial deposits.

As noted above, the Keil property maintains a series of small catch basins downstream of the Paradise Drive culvert crossing for Watersheds J and L. Collectively, they act to reduce the impact of this sediment flux on Keil Pond.

The current 303(d) list of impaired water bodies, maintained by the San Francisco Bay Regional Water Quality Control Board (RWQCB) and approved by the U.S. Environmental Protection Agency (USEPA) in June 2007, cites Central San Francisco Bay as impaired for pesticides chlordane, DDT, and dieldrin, and for dioxins, mercury (dissolved and sediment), furan compounds, exotic species, PCBs and selenium. Under the direction of USEPA, the RWQCB evaluates each impairing water quality constituent and if necessary, develops a Total Maximum Daily Load (TMDL) for that constituent. The TMDL and its implementation plan serve to attain and maintain water quality standards for the impaired water body. A list of current TMDLs and projected time frames for implementation of additional TMDLs are available on the State Water Resources Control Board website. To date, completed TMDLs that are relevant to the Easton Point project and Central San Francisco Bay include those for mercury and urban creeks pesticide toxicity.

On-Site Drainage Patterns

There are a total of 27 separate watersheds mapped at the site. There are five principal drainageways (Drainageways 1, 2, 3, 4, and 5) within four watersheds. Exhibit 5.5-1 shows designations of the watersheds and the five drainageways. Drainageways were classified by the extent of contributing area and the development of drainages with defined bed and banks. Each of the five drainageways is incised and is easily identified as a channel. All delineated drainageways and watersheds convey stormwater to roadside culvert inlets identified by the applicant's civil engineer and/or field verified by Clearwater Hydrology (the EIR hydrologist). Some differences occur in the watershed boundaries mapped by the applicant's civil engineer and by the EIR hydrologist. The site watershed boundaries and outlets identified in Exhibit 5.5-1 were field verified by the EIR hydrologist. Several culvert inlets along Paradise Drive are offset from the apparent channel outlets. In these cases, the gradient of the insloped, roadside ditch directs flow away from the topographically indicated outlets. These transpositions in outlet location also affect the boundary alignments.

All of the identified channels carry seasonal surface flow. They convey water during (and for some time after) the wet season and are expected to typically dry out by early summer. At the time of an April 1995 field inspection undertaken for the Town of Tiburon, flow was observed in Drainageways 1 and 3 and was absent in all other mapped drainageways. The flow in Drainageway 3 was evident along the exposed bedrock reach 100 feet upstream of the Paradise Drive culvert crossing but was fully lost to bed seepage below the bedrock reach. Subsequent field inspections in October and November 2000 revealed no surface flows in any of the drainages, although some minor flow probably did occur during the year’s initial fall rainstorms. Flow was observed in Drainageways 1, 2, and 3 during a March 19, 2009 site visit. During the 2009 visit, surface flow was evident in Drainageways 2 and 3 at what appears to be a trail crossing approximately 300 feet upstream of Paradise Drive.

Two existing storm drain systems also receive runoff from the site. The upslope segments of both the Mountain View Drive and Ridge Road systems consist of 12-inch drains on slopes with grades steeper than 30 percent.

Exhibit 5.5-1 also indicates the presence of a spring in Watershed C in the southwest corner of the site adjacent to the Old St. Hilary’s Open Space Preserve. Since this is the headwater area of the ephemeral channel which begins its incision downstream from the site boundary, the channel is not delineated as one of the site’s principal drainageways. Channel incision of this tributary drainage begins about five to ten feet outside the site's western boundary in the public open space. This off-site channel has undergone significant incision and continues to be subject to gully development and bank instability. The channel is confluent with other tributary channels which meet prior to discharging into Railroad Marsh, located just north of Tiburon Boulevard. Exhibit 5.5-2 shows the location of Railroad Marsh in relation to the project area.

Erosion and Sedimentation

Steep channel gradients and relatively rapid runoff rates result in episodic erosion of site drainageways. Channel downcutting is evident toward the lower ends of ravines where the accumulation of colluvium and the depth to bedrock are greater. At the lower ends of drainages, groves of dense riparian trees minimize the impact during most wet seasons. However, during wet winters, enhanced erosion can occur in the form of both channel erosion and gully headcutting at knickpoints in the drainageways. In dry and moderately wet years, vegetation reestablishes, and the cycle is retarded until the next severe winter.
Exhibit 5.5-2
Regional Hydrology and Railroad Marsh Watershed

Source: National Geographic Topo, Clearwater Hydrology, 2009
A total of 28 landslides have been identified on the project site (see Exhibit 5.4-1). Movement and failure of these slide masses can provide significant additional source material for downstream transport.

Significant sedimentation resulting from slope failures and channel incision can occur in the vicinity of Paradise Drive and downstream on the Keil property during severe rainstorms. The most severe on-site channel incision is occurring just upslope of the outlet for Watershed J, where Drainageway 2 is incising through an extensive landslide deposit (see Exhibit 3.0-9). Several hundred feet upstream of the outlet, the channel bifurcates and is continuing to cut headward. The larger of the two channel segments is headed by a cut approximately seven feet deep. Past instability in this drainage led the Keil property owner to install riprap lining along the downstream reach of the drainageway east of Paradise Drive. Three concrete weirs also were constructed along with companion catch basins located immediately upslope of the riprap in order to trap watershed sediments transported across Paradise Drive. Maintenance of these catch basins minimizes the entry of sediment to Keil Pond.

**Groundwater and Sensitive Habitats**

The site's shallow soils and steep slopes minimize opportunities for rainfall infiltration and groundwater recharge. However, the wedges of colluvium and landslide materials present in bedrock hollows and ravines are recharged by groundwater during the winter season. Also, a spring exists in at least one case (the Lands of Keil parcel) which appears to be fed, in part, by groundwater emanating from fractures in the underlying bedrock, particularly near the tops of ridges. Perched water tables are also created during the winter season in the colluvial wedges and landslide materials. During extreme rainstorms, the elevated pore pressures affecting the colluvium can produce landslides and debris flows.

Field inspections in April 1995 and October-November 2000 identified one spring, five seeps, and one seasonal pond on the project site in addition to the spring identified on the Lands of Keil that is surrounded by the project site. The wet winter preceding the 1995 inspection provided good late season surface indications of the presence of seeps and springs. However, due to the thickness of coastal scrub in the vicinity of the upslope reaches of the drainageways, other areally-limited seep zones could have escaped detection.

A spring is an identifiable, concentrated groundwater outflow from a geologic contact formed by rock strata of differing hydraulic conductivities. A seep is also a groundwater outflow emanating from a geologic contact. However, the magnitude of discharge is less and the surface area greater, producing a less concentrated discharge.

The spring in the southwest corner of the site (in Watershed C) was the only active spring observed on-site during the 1995 inspection. It begins at the head of the incised drainageway which proceeds west off-site. The Lands of Keil spring was not observed during the 1995 site inspections. However, discussions with the owner confirmed that the spring existed but was not visible because it was covered by a spring box. The Lands of Keil spring was not located during the May 2009 site visit. Dense vegetation prevented visual identification of the box, although the spring line was observed further downslope. The spring line is buried until it crosses under a social path approximately 300 feet upslope of Paradise Drive.

According to the owner, the Lands of Keil spring discharge is piped to an elaborate water distribution system on the Keil property. The system stores and distributes irrigation water throughout the property’s approximate 15 acres of gardens and landscaped grounds. It consists of four storage units which operate in series and are linked hydraulically in a circuit via a network of pipes, valves, and
pumps. At the head of the system is a 5,000-gallon redwood water storage tank built in about 1985. Gravity discharge from the spring pipe first enters this redwood tank and fills it to capacity before a piped overflow delivers excess water to a second plastic tank downslope. This second plastic tank was built in 1995 and also has a 5,000-gallon capacity. Once the downslope plastic tank fills, valves set in the distribution system can direct flow to either of two brick cisterns located farther downslope or can divert the overflow to a small ephemeral creek. This creek normally maintains flow during the winter and into the early summer months, after which time the tank overflow normally stops.

The underground brick cisterns were constructed in the 1890s and receive both tank overflow and groundwater inflow. Cistern depths at the upper and lower locations measure 60 and 40 feet, respectively. Cistern construction is similar to more modern wells to the extent that the upper part of the annular space is mortared to provide a seal while the lower portion is unmortared to allow for seepage into the well. According to the owner, groundwater inflow rates to the higher elevation cistern typically have been higher than inflow rates to the lower cistern. Presumably, the loss to downgradient seepage is minimal due to the presence of the Bay interface. Pumps set in the cisterns enable the property managers to either feed the irrigation system or recirculate stored waters back to the upper above-ground storage tank. The flexibility of the storage and distribution system has enhanced the ability of the manager to better allocate water resources. Even before installing the storage tanks, the supply was always sufficient to maintain the gardens. However, during the worst period of the 1976-1977 drought, springflow was so limited that the lawns were allowed to die.

Exhibit 5.4-1 reflects an interpretation of past trenching and borehole data compiled by the applicant’s geologist and reviewed by the EIR geologist. Exhibit 5.4-1 delineates areas of active and potentially active landslide deposits and colluvium. Each of these features is potentially subject to downslope movement under conditions of intense rainfall and wet antecedent soil conditions. Mapped geologic units in the vicinity of the Lands of Keil parcel include primarily landslide and colluvial deposits. The map shows landslide deposits (Qls designation) bordering the Lands of Keil parcel to the north, west and east, and colluvium and bedrock (designations Qc and fm, respectively), to the south. Reactivation of the adjacent slide zones could result in an expansion of the slide(s) and incorporation of some of the colluvium which currently supports the spring box and the downslope pipe connection. Movement in the downslope slide deposits also could damage the box-piping system for the spring.

One seep along the approximate 400-foot contour measures about six by ten feet in area and is located upslope of the upper end of an incised drainageway which forms the southern fork of Drainageway 3 in the next draw to the northeast of the Lands of Keil. A second seep and its related wetland occupy the southern part of the topographic bench adjacent to Drainageway 2. This large seeped area measures approximately 50 by 100 feet and was saturated throughout its extent during a prior field inspections conducted in April 1995. During a May 2009 field inspection the seeps and seasonal pond near Keil Spring were dry; however, lush wetland vegetation still covered the large seep area near Drainageway 2. Near the lower southwest corner of the large seep, discharging seepage was observed draining toward Drainageway 2 (below proposed Lots 12 through 14). In 1995, a third seep was observed at the head of Drainageway 2.

The fourth and fifth seeps were identified in 1995 along Drainageway 1 in Watershed E. The lower of the two seeps is located within a well-incised reach of the main drainageway and occupies about 0.3 acre. The higher elevation seep is located in a small topographical depression immediately adjacent to a short tributary which joins the main drainageway from the south and measures 0.2 acre.

One seasonal pond was identified on the project site. It is located 75 feet northeast of the northeastern corner of the Lands of Keil. No water was standing in the pond during the October-November 2000 field inspections, but the absence of vegetation in the depression suggested at least periodic seasonal
ponding. No water was observed in the pond during the May 2009 visit. The pond is flanked on the upslope (west), east, south sides by landslide deposits and to the north by colluvium over bedrock. The landslide and colluvial materials can perch water within them, daylighting as seasonal seeps and ponds. The fractured rock, on the top of the ridge and under the adjacent colluvial deposits provides ready sources of subsurface water recharge to the pond during rainstorms.

**On-Site and Downstream Flooding**

During significant rainfall events, some minor road flooding can occur along Paradise Drive due to partial or full obstruction of culvert inlets, or in particular cases, to inadequate, unobstructed culvert capacities. Severe storm events may also trigger hillslope or channel erosion. Moderate channel downcutting is evident in the primary east-facing drainageways which flow to Paradise Drive and Keil Pond. The January 1982 landslide in the principal north-facing watershed (Watershed AA) provides an example of the extent of debris available for downslope transport. This form of slope failure typically results from prolonged intense rainfall which produces intense groundwater pressures in pockets of colluvial soils. If such an event were to occur in one of the principal east-facing watersheds, Paradise Drive culverts would become fully plugged, and debris and floodwaters would cascade onto the Keil property. Increased sedimentation in Keil Pond would be a secondary impact of an upslope landslide in Watersheds J, L, M or N. Similar obstruction of Paradise Drive culverts could occur on the Drever (2900 Paradise Drive), Klein (2960 Paradise Drive), and other north-facing properties, due to slope failures in Watersheds S, T, U, V, W, X, Y, and Z.
Hydrology and Water Quality – Significance Criteria

The hydrology and water quality analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review guidelines. Based on the State CEQA Guidelines the project would have a significant hydrology, drainage, or water quality impact if it:

**Water Quality**

- Violated any water quality standards or waste discharge requirements.
- Substantially degraded water quality.

**Drainage**

- Substantially altered the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.
- Substantially depleted groundwater supplies or interfered substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.
- Substantially altered the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increased the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site.
- Created or contributed runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provided substantial additional sources of polluted runoff.
- Required or resulted in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

**Flooding**

- Placed housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Placed within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Exposed people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

**Seiche, Tsunami, and Mudflow**

- Resulted in inundation by seiche, tsunami, or mudflow.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant hydrology, drainage, or water quality impact if it:
• Proposed facilities that would be located in flood-prone areas.
• Proposed facilities that would increase off-site flood hazard, erosion, or sedimentation.
• Proposed uses or facilities that would substantially degrade or deplete groundwater resources.
• Proposed facilities that would interfere substantially with groundwater recharge.
• Proposed uses or facilities that would substantially degrade surface or groundwater quality.
**PEAK FLOW ASSESSMENT**

The applicant's civil engineer prepared a *Drainage Report*[^5] which included calculations for peak discharge rates generated by the ten-year and 100-year design rainstorm over project site watersheds using Marin County rainfall-runoff methodology.[^6] It is a locally-tailored version of the Rational Method used by the California Department of Transportation (Caltrans). Clearwater Hydrology (the EIR hydrologist) conducted a peer review of the *Drainage Report* and calculated peak discharge computations for both existing and post-project land use conditions, including assumptions made for runoff coefficients (“C” value) and selected rainfall intensities. The selected runoff coefficients and rainfall intensities for the existing site conditions were found to follow Marin County guidelines; however, the EIR hydrologist believes that the County guidelines overestimate the runoff coefficient for existing land use conditions. If the runoff coefficient is overestimated for the existing site condition, increases in peak flow rates under developed conditions are not adequately reflected in the calculations. Consequently, the EIR hydrologist prepared an independent peak flow assessment utilizing lower “C” values, for the undeveloped drainage areas and a slightly higher “C” value for the developed condition since most site roads are very steep. The revised “C” values were based on those published by the U.S. Geological Survey for use in stormwater drainage design in the San Francisco Bay Region.[^7] The open space slopes on the project site were characterized as natural watershed and assigned a conservative “C” value of 0.4.[^8] The applicant’s civil engineer used an undeveloped area “C” value of 0.65, which would result in higher existing condition peak flow values. The applicant’s civil engineer used a runoff coefficient of 0.9 for developed spaces, whereas the EIR hydrologist used a revised runoff coefficient of 0.95 for developed spaces since most of the project’s proposed roads are steep.[^9]

In addition to computing peak flow rates, the applicant's civil engineer performed calculations for sizing detention facilities to attenuate post-project increases in peak flow rates, while also detaining the increased runoff volume from the ten-year to the 100-year design storm. As stated in the *Drainage Report*, the applicant's civil engineer would size detention basin outlet controls (e.g. orifices) during the final design phase to ensure that ten-year existing peak flow rates would be maintained for the ten-year up to the 100-year post-project condition in each component watershed.

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[^8]: *Ibid*.

[^9]: *Ibid*. 
The detention facility sizing routine used by the applicant's civil engineer appeared to be a combination of multiple detention sizing methodologies. Also, many of the assumptions made for detention facility sizing were not clearly articulated in the Drainage Report. Due to this use of multiple methodologies, the EIR hydrologist completed independent detention volume calculations based on a single, consistent methodology. The method used was the Modified Rational Method, as presented in Pond Sizing for Rational Formula Hydrographs.  

Exhibit 5.5-3 documents the detention facility size requirements as calculated by the EIR hydrologist. Also presented in the exhibit are the existing condition and post-project 100-year peak flow rates, along with the existing condition ten-year peak flow rate. Further information on the EIR hydrologist's calculation methodology, including delineated watershed areas and spreadsheets used to compute the peak flow rates and detention volumes listed in Exhibit 5.5-3, is included in the Appendix. The EIR hydrologist delineated areas deemed appropriate for completing the detention volume calculations on the AutoCAD file provided by the applicant's civil engineer. When conducting the detention analysis, the EIR hydrologist utilized additional impervious lot areas that the Drainage Report stated would drain to a particular detention facility. The detention facility and detention facility outfall locations are shown on Exhibit 5.5-5.  

Exhibit 5.5-3  
Peak Flow Rates and Detention Facility Size

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<th>100-Year Pre-Project (cfs)</th>
<th>100-Year Post-Project (cfs)</th>
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11 The detention facility and detention facility outfall locations are in the same locations as presented in the Drainage Report and on the Grading Plan, Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C-1A and C-1B, Backen Gillam, International Planning Associates, CSW/Stuber-Stroeh, revised January 29, 2009, for the proposed construction road.
5.5 Hydrology and Water Quality

2008 Easton Point Residential Development Draft EIR

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<td>18</td>
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<td>2.41</td>
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<td>19</td>
<td>0.11</td>
<td>0.17</td>
<td>0.63</td>
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<td>21</td>
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</tr>
<tr>
<td>22A</td>
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<td>1.38</td>
<td>1,079</td>
</tr>
<tr>
<td>22B</td>
<td>0.37</td>
<td>0.58</td>
<td>1.54</td>
<td>1,082</td>
</tr>
<tr>
<td>23A</td>
<td>0.80</td>
<td>1.25</td>
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<tr>
<td>23B</td>
<td>0.85</td>
<td>1.33</td>
<td>2.16</td>
<td>1,024</td>
</tr>
</tbody>
</table>

a No detention is required at the location of Detention Facility #1. The post-project watershed area is reduced from the pre-project watershed area resulting in lower peak flow rates under the post-project condition.

Source: Clearwater Hydrology 2009

Due to the layout of the proposed site roads, many artificial watershed concentration points would be created at each proposed detention facility outfall. At some locations, minor cross watershed transfers would result in increases in drainage area at a particular watershed concentration point under post-project conditions. To ensure peak flow rates are not increased at each outfall, and thus at the culvert crossings below Paradise Drive, the EIR hydrologist calculated pre-project peak flow rates based on the pre-project watershed area for each outfall location. The post-project peak flow rate was then calculated for the entire area contributing to the outfall location. Each post-project watershed area was larger than the pre-project watershed area due to proposed grading and road construction (except for Detention Facility #1 see Exhibit 5.5-3). The peak flow rates were assessed in the manner described above to account for modifications to drainage patterns of the site, and to ensure that the ten-year pre-project discharge to and through the culverts under Paradise Road would remain unchanged for post-project conditions.

The detention facilities placed throughout the site would be subsurface and consist of concrete storm drain pipes, concrete vaults or some other type of structure capable of storing water. Each detention facility would have a metered outlet, likely consisting of a single orifice or multiple orifices designed to regulate outflow from the detention facility. Depending on the final detention facility design, the orifice could take the form of a locally downsized pipe. An orifice or downsized pipe would direct regulated flow to an open channel, some type of dispersion structure, or into a contiguous, down-gradient segment of the storm drain system. As discussed in the Drainage Report, the detention facilities have been proposed to store the additional volume of runoff from the 100-year post-project design storm, and release the pre-project ten-year peak flow during the post-project ten-year to 100-year design storms (i.e. during a post-project 100-year design storm the flow rate from the detention facility would be equivalent to the ten-year pre-project flow rate).

The Drainage Report also includes an example calculation for detention facility sizing for the individual houses. Each house would go through a separate design review process at the time the house is developed. Each house would be responsible for the design and construction of the associated detention system, unless it is one of the houses that has been assumed to drain to the road.
detention system (see Drainage Report and the Appendix). Although the Drainage Report refers to orifice sizing for the ten-year pre-project release, no orifice calculations were completed. Exhibit 5.5-4 lists the type of detention facility outfall expected at each outfall location as presented in the Drainage Report.

Presented in the Drainage Report is a sample calculation for the future development of Lot 7. As stated, the design of residential detention systems would occur during the Design Review process for each lot. Discharge for the detention vaults would be directed to a level spreader, infiltration trench, bubble-up box, or rip rap pad. The EIR hydrologist completed detention facility sizing calculations for Lot 7 using the Modified Rational Method. Assumptions for lot impervious areas are presented in the Appendix. Because all impervious area is presumed to be pervious prior to the development of each lot, and the assumed time of concentration for each lot would be five minutes, the calculated detention facility size presented in the Appendix for Lot 7 would be proportional to all lots at the project site. For example, Lot 7 was determined by the EIR hydrologist to include 5,715 square feet of developed area, requiring 187 cubic feet of detention storage. That means there would be 32.7 cubic feet of detention storage for every 1,000 square feet of impervious area. Thus, a lot with 6,000 square feet of developed area would require 196 cubic feet of detention storage.

Because the applicant’s civil engineer did not use a consistent methodology for computing detention volume requirements in the Drainage Report, required detention volumes calculated by the EIR hydrologist (see Exhibit 5.5-3) should not be compared to those in the Drainage Report. If the detention volumes calculated by the EIR hydrologist are utilized and outlet controls are appropriately sized to maintain detention facility outflows at the ten-year pre-project level, there should be no impact to the conveyance capacity of the culverts below Paradise Road.

**NO or LESS-THAN-SIGNIFICANT IMPACTS**

Based on the findings of the analyses completed as a part of this Draft EIR it has been determined that the proposed 2008 Easton Point Residential Development project would have no or less-than-significant impacts for the following significance criteria:

- Placed housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map

- Placed within a 100-year flood hazard area structures that would impede or redirect flood flows.

The project site is not within a 100-year flood hazard area. Moreover, no buildings are proposed within the site’s small drainageways or their active flow zones. No impact would occur.

- Resulted in inundation by seiche, tsunami, or mudflow.

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12 Five minutes is accepted as the minimum time of concentration for a small watershed.

13 No orifice sizing calculations were completed in the Drainage Report since the configuration of the detention facilities is unknown until final design.

The lowest portion of the project site is at 100 feet NGVD, and thus is far above the zone of inundation by a seiche or tsunami, which is predicted at +8.6 feet NGVD. All structures would be set back significantly from the on-site drainageways, so none of the proposed buildings would be subject to impacts due to mudflows. No impact would occur.

**IMPACT ANALYSIS**

**Impact 5.5-1 Water Quality**

Project implementation would increase the area devoted both to impervious surfaces (roads, driveways and roof tops) and to potentially irrigated landscaping. Automobile traffic can contribute oil and grease, and heavy metals to site impervious surfaces, and thus to stormwater runoff. Residential lot development could be accompanied by applications of fertilizers and chemicals (such as herbicides and pesticides). Over-irrigation, combined with accidental spills or releases of fertilizer or pesticides / herbicides, could result in downstream migration of contaminated runoff to drainageways tributary to Keil Pond and Central San Francisco Bay. These risks to water quality would be a significant impact. Due to the listing of Central San Francisco Bay under the Clean Water Act, Section 303(d) list of impaired water bodies as impaired for mercury, polycyclic aromatic hydrocarbons (PAHs), Dioxin compounds, Furan compounds PCBs, Selenium and several pesticides, including chlordane, DDT and dieldrin, even minor amounts of these substances above ambient watershed levels would result in a significant impact.

The project proposes to utilize progressive technologies and design methodologies to reduce water quality impacts associated with urbanization. The Precise Development Plan (PDP) includes a Stormwater Control Plan. The Stormwater Control Plan is a combination of both construction and post construction, best management practices (BMPs) aimed at reducing water quality impacts associated with project construction and future project buildout, when houses are constructed and occupied. Areas for silt control devices (e.g. silt fence) and jute netting are shown on the Stormwater Control Plan. Both of these BMPs are shown along the construction road connecting Forest Glen Court to Mt. Tiburon Court. Silt fences would be installed prior to any site grading to ensure that exposed sediment would not be mobilized off-site or into site drainageways. Jute netting would be placed over exposed areas after project construction to protect against rain splash erosion and mobilization of sediment via stormwater surface flow.

Once the proposed project is constructed and individual lots are developed, permanent BMPs would help to protect water quality. As indicated on the Stormwater Control Plan, filtration systems would be incorporated into road catch basins; house roofs would be constructed with roof downspouts directing runoff to bioretention planters / areas so that all roof water would be treated; impervious surfaces associated with residences would be constructed so that all runoff would be directed to bioretention planters, areas or devices; and landscaping would be designed to meet the requirements of

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15 Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound, Technical Report H-75-17, Hydraulics Laboratory, US Army Engineer Waterways Experiment Station, Vicksberg, MS, November 1975. Figure cited is 500-yr. tsunami runup prediction for northern shoreline of Tiburon Peninsula.


17 Based on Marin County requirements the applicant's Stormwater Control Plan can be described as a preliminary plan. To be acceptable to the County as a "Stormwater Control Plan" a stand alone document with greater detail would need to be prepared (see Mitigation Measure 5.5-1(b)).
Marin County Code (MCC) Section 23.19 (Integrated Pest Management Program). There is additional language which states that grassy swales would be utilized for water quality treatment where possible. The Conceptual Grading Plan for each lot shows a swale, which the EIR hydrologist assumed to be a bioswale designed to treat stormwater at each proposed residence. All stormwater runoff would be treated prior to reaching detention vaults. Outlets to detention vaults would lead to outfalls on hillslopes and drainageways. Exhibit 5.5-4 lists the type of outfall for each watershed area that has an outfall structure. Exhibit 5.5-5 shows the location of each detention facility and detention facility outfall. Outfalls that daylight onto hillslopes or into infiltration trenches on hillslopes would allow for additional treatment of stormwater via vegetation and soil contact and infiltration, before it reaches site drainageways.

Exhibit 5.5-4
Detention Facility Outfall Type

<table>
<thead>
<tr>
<th>Detention Facility and Outfall No.</th>
<th>Type of Detention Outfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dispersion trench</td>
</tr>
<tr>
<td>2</td>
<td>Dispersion trench &amp; bubble-up</td>
</tr>
<tr>
<td>3</td>
<td>Released onto Mountain View Road</td>
</tr>
<tr>
<td>5A-B</td>
<td>Rip-rap pad</td>
</tr>
<tr>
<td>6A-H</td>
<td>Surface level spreader a</td>
</tr>
<tr>
<td>15</td>
<td>Surface level spreader</td>
</tr>
<tr>
<td>16</td>
<td>Surface level spreader</td>
</tr>
<tr>
<td>17</td>
<td>Surface level spreader or dispersion trench</td>
</tr>
<tr>
<td>18</td>
<td>Bubble-up box in watershed drainage course</td>
</tr>
<tr>
<td>19</td>
<td>Infiltration trench</td>
</tr>
<tr>
<td>21</td>
<td>Surface level spreader</td>
</tr>
<tr>
<td>22A-B</td>
<td>Surface level spreader</td>
</tr>
<tr>
<td>23A-B</td>
<td>Bubble-up box in Drainageway 1</td>
</tr>
</tbody>
</table>

a The detention outfalls for Detention Facilities 6A-H were inferred from the Precise Development Plan, Grading Plan, prepared by the applicant's civil engineer. The detention facility numbers in the exhibit coincide with the developed watershed designations in the Drainage Report, Onsite Drainage Hydrology and Hydraulics for Easton Point Master Plan, Precise Plan, Tentative Map, Marin County, California, prepared by Land Development Solutions, Inc, January 29, 2009.

Source: Clearwater Hydrology 2009

As indicated on the applicant's Stormwater Control Plan, the filtration systems that would be incorporated into road catch basins would be Filterra Bioretention Systems. These systems are an at-the-source treatment strategy designed for relatively high pollutant removal efficiency via the use of a

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18 Lot Specific Conceptual Grading Plans, 43 sheets (G-1 to G-43), project applicant, January 2009.
Exhibit 5.5-5 (a)
Detention Facility and Outfall Locations

Source: Clearwater Hydrology 2010. Base Topography provided by applicant. Detention vault locations and discharge points provided by Land Development Solutions, Inc. Seeps, spring and pond mapped by the applicant's and EIR consultants since 1995.
Exhibit 5.5-5 (b)
Detention Facility and Outfall Locations

Source: Clearwater Hydrology 2010. Base Topography provided by applicant. Detention vault locations and discharge points provided by Land Development Solutions, Inc. Seeps, spring and pond mapped by the applicant's and EIR consultants since 1995.
plant / soil / microbe treatment media. The manufacturer’s web site, www.filterra.com, provides further details on the components, operation and maintenance of Filterra Bioretention Systems. Exhibit 5.5-6 provides the expected pollutant removal efficiency rates shown on the company website.

**Exhibit 5.5-6**

**Pollutant Removal Efficiency for Filterra Bioretention Systems**

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Removal Rate (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS (total suspended solids)</td>
<td>85</td>
</tr>
<tr>
<td>Phosphorus Removal</td>
<td>73</td>
</tr>
<tr>
<td>Nitrogen Removal</td>
<td>43</td>
</tr>
<tr>
<td>Heavy Metal Removal</td>
<td>33 – 82</td>
</tr>
<tr>
<td>Fecal Coliform</td>
<td>57 – 76</td>
</tr>
<tr>
<td>Predicated Oil &amp; Grease</td>
<td>&gt; 85</td>
</tr>
</tbody>
</table>

Source: Clearwater Hydrology 2009

Even though the applicant's Stormwater Control Plan states that landscaping would be designed to minimize the use of pesticides and herbicides, and the *Easton Point Project Narrative* 19 states that introduced landscaping should include approximately 80 percent California native species that are drought tolerant, it is expected that lawn and landscaping irrigation and fertilization would accompany individual lot development, along with the application of landscape chemicals (including herbicides and pesticides). Over-irrigation, excessive fertilization, or application of other chemicals could transfer nutrients and chemical residues in irrigation runoff. Some portions of non-impervious lot drainage would proceed overland or within the upper soil profile toward grassland / chaparral buffers before entering the site’s principal drainageways and swales. While no ready means are available to quantify the potential downstream migration of contaminants, the effect on the receiving waters in Keil Pond, Keil Cove, Railroad Marsh, and San Francisco Bay could be locally significant. As discussed in *Section 5.6 Biological Resources*, Keil Pond, in particular, supports a breeding population of the threatened California red-legged frog. As a result, even minor episodic introduction of contaminants could be harmful. However, baseline water quality measurements would be required before upslope development proceeded to gage any long-term diminution in pond water quality.

Field data compiled by the U.S. Environmental Protection Agency (USEPA) and other researchers have confirmed that heavy metal contaminant concentrations in stormwater from residential areas can significantly exceed those from open space areas. 20 For Bay Area sampling stations, USEPA and *Regional Water Quality Control Board (Basin Plan)* 21 water quality criteria were often exceeded for heavy metals (such as nickel, lead, mercury, zinc, copper, chromium, cadmium, and selenium). In addition, the dissolved copper water quality criteria was shown to be exceeded when urbanization,

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19 *Easton Point Project Narrative*, project applicant, 2009.


21 *Water Quality Control Plan--San Francisco Bay (Region 2)*, San Francisco Bay Regional Water Quality Control Board (RWQCB), June 1995.
including residential, commercial, and industrial land uses, reached more than 45 percent of the total watershed area. However, even at relatively lower residential loading rates from less developed watersheds, more stringent water quality criteria for aquatic habitat protection can be exceeded. Oil and grease contamination also affects stormwater runoff from road and driveway surfaces.

Watershed buildout under the proposed project, including the construction access road, would increase urbanized area in the Keil Cove Watershed, including Watersheds E through G, from 28 percent to 36 percent. Similarly, urbanized area in the Keil Pond Watershed would increase from six percent to 13.7 percent. Urbanization in the composite watershed draining north to Central San Francisco Bay (on-site Watersheds Q through AA, plus shoreline lands to the north of Paradise Drive) would increase from 4.9 percent to 9.3 percent. Project urbanization within the Railroad Marsh Watershed, including on-site Watershed C, would increase from 36.3 percent to 38.1 percent. As indicated, these comparative developable area percentages were computed for both the on-site and off-site portions of the watersheds that originate on-site. Existing development in the watershed which drains the Hill Haven neighborhood already surpasses 70 percent and would result in a minor increase by the proposed project development in Watersheds B and D.

Although the most current available technologies suitable for water quality protection, considering site constraints, are to be installed during construction and utilized in perpetuity, maintenance is required to ensure adequate function. Bioretention facilities need adequate vegetation growth for proper filtration. Future home and landscape modifications may modify or eliminate bioretention areas. Subgrade drainage pipes associated with bioretention facilities may become blocked and not adequately drain the areas during rain events when subdrainage flow is required to direct filtered stormwater away from a bioretention area, and thus more stormwater runoff enters the facility than can be treated. In addition, the Filterra Bioretention Systems require annual maintenance to remove accumulated sediment and debris, and replacement of the pretreatment mulch. Because chemicals may be applied to landscaped areas and maintenance activities are required to ensure adequate function of water quality treatment measures, improper maintenance could substantially degrade water quality in Keil Pond, Keil Cove, Railroad Marsh, and San Francisco Bay. The combination of petrochemical residues and heavy metal contaminants from increased automobile traffic and chemical runoff from landscape maintenance could substantially degrade water quality in these waterbodies, and thus, would be a significant project impact on water quality.

**Mitigation Measure 5.5-1** The applicant shall implement the following mitigation measures in order to reduce the project’s water quality impacts to less-than-significant levels:

**Mitigation Measure 5.5-1(a)** Implement the construction BMPs shown on the applicant's Stormwater Control Plan. This includes the silt control devices and jute netting. In addition, the applicant shall prepare a Stormwater Pollution Prevention Plan (SWPPP) to be implemented during construction to ensure adequate measures would be taken to protect water quality. The SWPPP shall pay particular attention to the following:

- The construction road and associated vehicular pollutants.
- Vehicle wash areas to ensure that sediment is not tracked onto Paradise Drive.
- Fuel and other toxic compound storage.

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22 Copper is a heavy metal commonly used in the manufacturing of disk brake pads.
- BMPs (best management practices) to control sediment and erosion.
- Revegetation.
- Trash control.

Marin County Code Section 24.04.627, provides additional information on SWPPP requirements. Preparation and implementation of a SWPPP is required for approval of coverage under the Construction Activities Stormwater General Permit issued by the San Francisco Bay Regional Water Quality Control Board. Construction General Permit coverage would be required for the 2008 Easton Point Residential Development project since it would disturb more than one acre.

**Mitigation Measure 5.5-1(b)** Implement the post-construction BMPs shown on the applicant's Stormwater Control Plan including: detaining the post development increase in peak flow rates, directing roof runoff and runoff from other future residential impervious surfaces to bioretention areas, and installing Filterra Bioretention Systems in road catch basins. In addition, the applicant shall prepare a Stormwater Control Plan as a stand alone document, detailing post-project stormwater control measures. A Stormwater Control Plan is required for new residential subdivisions with ten or more lots to comply with Marin County's Phase II Municipal Stormwater NPDES permit. Marin County Code Section 23.18.093, provides additional information on Stormwater Control Plan requirements. The Marin County document, *Guidance for Applicants, Stormwater Quality Manual for Development Projects in Marin County*, should be utilized during preparation of the Stormwater Control Plan. The document provides a Stormwater Control Plan checklist to be utilized during plan preparation. Particular attention should be paid to identify pollutant sources related to lawn care, and for each pollutant source, a source control measure(s) should be identified for use during the development of each lot to reduce identified pollutants to the maximum extent practicable. Source control measures include:

- An irrigation schedule linked to typical seasonal soil moisture levels.
- Provide residents with a list of specific chemical inputs tested and cleared by the USEPA for application to vegetation.
- Indicate frequency and scheduling of the chemical inputs based on site-specific characteristics (such as soil and vegetative cover and rates of uptake) and the acknowledged sensitivity of downstream receiving waters.

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23 Construction Activities Stormwater General Permits are issued by the State of California Regional Water Quality Control Boards as required by the Clean Water Act, National Pollutant Discharge Elimination System (NPDES) Permit Program.

24 A SWPPP checklist can be found at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/const_swppp.pdf

25 Marin County permit coverage under the NPDES Phase II General Permit issued by the San Francisco Bay Regional Water Quality Control Board commenced on March 30, 2004. For further information see http://www.mcstoppp.org/newdevresources.htm

• Include homeowner education information to be incorporated in the project’s CC&Rs to instruct both the owners and their landscaping contractors in safe chemical handling and application procedures.

In addition to requirements outlined in the *Guidance for Applicants, Stormwater Quality Manual for Development Projects in Marin County* the applicant shall incorporate the following site-appropriate BMPs or their equivalents, in the project Stormwater Control Plan for short- and long-term implementation by the applicant and individual lot owners, in order to comply with the requirements of the Phase II NPDES permit:

• The Property Owners’ Association (POA) shall privately contract with Mill Valley Refuse Service (MVRS) or its equivalent to undertake monthly street sweeping. MVRS already serves numerous areas on the Tiburon Peninsula.

• The POA shall provide each homeowner with pamphlets or other informative documentation regarding the use of less toxic pest management procedures, including integrated pest management. MCSTOPP.org has related on-line information which also includes descriptions of less toxic pest control products and procedures, the effectiveness of which has been proven in the scientific literature (e.g. see www.ourwaterourworld.org/). The TMDL study on pesticides in urban creeks in the San Francisco Bay Region also references significant recent research into pesticide practices and alternatives to limit their migration to surface waters and San Francisco Bay.

• Each residence shall incorporate a bioswale, or other geotechnically appropriate methods for treatment of runoff from the lot's impervious surfaces. The swale shown on each lot's Conceptual Grading Plan can be used for guidance. Guidelines shall be incorporated into the Stormwater Control Plan from the *Stormwater Quality Manual for Development Projects in Marin County* for sizing treatment facilities (e.g. bioswales).

**Significance after Mitigation** Implementation of Mitigation Measures 5.5-1(a) and 5.5-1(b) would substantially improve the prospects for minimizing on-site and downstream degradation of water quality and would reduce the project’s impact to a less-than-significant level. The components contained in this measure also represent the best available practical technology for addressing water quality impacts associated with urbanization. Therefore, implementation of Mitigation Measures 5.5-1(a) and 5.5-1(b) would reduce project impacts on water quality to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for preparing the SWPPP, Stormwater Control Plan and the NPDES General Permit application. The San Francisco Regional Water Quality Control Board would be responsible to approve the SWPPP and to issue the NPDES permit. Marin County would be responsible to approve the stand alone Stormwater Control Plan. The POA would be responsible to contract with a qualified company to service the Filterra Bioretention Systems and sweep the development area streets. The POA would also be responsible to provide pamphlets to each homeowner regarding common residential pollutants and ways to eliminate their use.
Impact 5.5-2  On-Site Drainage Patterns - On-Site and Off-Site Flooding

Construction of houses, roads, and drainage facilities in Watersheds B, D, C, E, J, L, M, N, O, P, R, S, V, and W would cause a minor transfer of runoff across watershed boundaries. Development in these watersheds, would result in the capture of road runoff via storm drains, with the release of captured water onto neighboring slopes or into site drainageways.

To provide adequate sight distances for drivers entering Paradise Drive in the vicinity of Forest Glen Court and access driveway (Lots 21 through 23) intersections, portions of the adjoining hillslopes would be graded and retaining walls constructed. These project activities could result in modifications to or obstruction of roadside drainage ditches and cross-roadway culverts not presently incorporated into the proposed project. Such modifications could decrease the efficiency of local stormwater drainage and increase the risk of episodic nuisance flooding along the insloped, shoulder drainage ditches and along Paradise Drive. This would be a significant impact.

Road and storm drain construction would alter the pattern of surface drainage at the site. Minor cross-watershed transfers of surface drainage would occur along Ridge Road as it traverses the ridgeline separating Watersheds J and E. Cross-watershed runoff transfers would also occur along Ridge Road and Mt. Tiburon Court from Watersheds B, D, J and L to Watershed C. Additional areas of cross-watershed transfer would occur along the length of Forest Glen Court, including the paved construction road, as it traverses Watersheds L, W, V, M, N, O, P, R, and S. Stormwater falling on the proposed roads would be conveyed to catch basins that direct flow to detention vaults and then hillslope or drainageway outfalls. Under the proposed grading, roads would cross existing watershed boundaries. All catch basins and outfalls would not be spaced to capture and release stormwater within existing watersheds. Some have been spaced such that after site grading, rainfall that falls within an existing watershed boundary would be conveyed as surface flow across pre-project watershed boundaries, prior to being collected in a catch basin and directed to a hillslope or drainageway outfall. The catch basins along the construction road would be spaced in a manner that would result in very minor cross-watershed transfers.

Interception of runoff by road curb and gutter systems would alter existing hillslope drainage patterns within the watersheds described above. Where road curb and gutter systems would alter local drainage patterns, the alteration would concentrate stormwater drainage at each catch basin / detention vault / outfall system. In other words, where diffused runoff occurs under existing conditions, the developed condition would concentrate stormwater discharges at several points along the conveyance system (i.e. site roads). In addition, the concentrated runoff would be routed to locations where the captured water would be released onto hillslope areas or into drainages, where it would either infiltrate or continue as surface flow. There is a potential for erosion at the locations where concentrated flow would be released. The applicant has proposed to maintain peak flow rates at the ten-year pre-project level (see Peak Flow Assessment above and Impact 5.5-7 On-Site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection), however, increased peak flow rates for more frequent, lower recurrence interval storms (e.g. two-year and five-year) may result in hillslope or drainageway erosion (see Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation). The two-year flow is often referred to as the channel-forming discharge, since it is the most frequent high flow conveyed by a natural channel. Title 24 of the Marin County Code requires that project peak discharges for the 100-year design rainstorm be mitigated to pre-project levels.

Catch basins would be spaced in a manner that would result in only minor cross-watershed transfers along the proposed roads. The pattern of surface drainage over the rest of the site would remain largely unchanged. This would include any drainage resulting from excess irrigation on the site during
the dry season. Landslide stabilization measures would be dewatered locally using subdrains. These subdrains would convert some subsurface drainage from upslope to more concentrated flow downslope. Although subdrains would alter groundwater patterns (see Impact 5.5-4 Groundwater Recharge and On-Site Hydrology and Impact 5.5-5 Groundwater Recharge and Off-Site Hydrology), drainage direction would remain unchanged.

Since detention vaults and associated outfalls have been sized to only handle runoff from site roads (and in some instances driveway extensions and additional lot impervious area), all lots would be required to drain away from roads. This would ensure that each lot is developed in a manner such that stormwater would remain within the lot watershed. Each lot would be required to detain increases in peak flow rates as outlined in the Drainage Report. Stormwater falling on the impervious portions of each lot would be concentrated through the capture of excess runoff in pipes and the routing of flow to the lot's detention system. Detained stormwater would be released via level spreaders, bubble-up boxes, or other methods deemed appropriate at the time each lot is developed. The development of each lot would require design approval from Marin County.

Installation of subdrains below Drainageways 2 and 3 as shown on Exhibit 5.4-3 would effectively dewater the channels during periods of lower flows when the subdrain system capacity is not reached. As discussed in Section 5.4 Geology and Soils, subdrainage would be required to dewater slopes to effectively stabilize landslide deposits. During periods when the subdrain system is able to adequately convey flow, surface water would be captured and routed past the drainageways’ lower reaches. The subdrains would outlet just upstream of the Paradise Road culverts. This conversion of groundwater to surface water would lessen the availability / occurrence of seasonal (i.e. spring and early summer) base flow in these lower drainageway reaches. However, this would not result in a significant impact on on-site drainage patterns. For a discussion of potential biotic impacts resulting from seasonal drainageway dewatering, see Section 5.6 Biological Resources and Impact 5.6-2 Impacts to the California Red-Legged Frog.

The proposed project includes improvements along Paradise Drive to improve the sight distance at Forest Glen Court and the driveway to Lots 21 through 23. Mitigation Measure 5.1-3 includes additional improvements at Forest Glen Court in regard to providing adequate sight distance.

The EIR hydrologist conducted a walking inspection of the projected road intersections in March 2010 to determine the approximate extent of any potential impacts to site drainage patterns, including Paradise Drive road culverts.

At the Forest Glen Court intersection, hillslope grading and retaining wall construction is proposed both north and south of the intersection. Grading to the south of the intersection could affect the perimeter of a broad swale that is mapped as a landslide feature on the project site (see Exhibit 5.4-1). This landslide is proposed to be repaired. Grading incursions into the western edge of the landslide envelope would need to be done under proper geotechnical supervision. The northward sight-line at the intersection of Paradise Drive and the Lots 21 through 23 driveway would be enhanced by minor hillslope grading in the vicinity of Lots 21 and / or 22, and provision of expanded roadway shoulders with tapers immediately north and south of the intersection. Stormwater runoff collecting in the inslope roadside ditch is currently conveyed north to a road culvert located approximately 320 feet

27 Whenever landscaping is installed, there always is the possibility of overwatering, despite use of native drought tolerate plant species required by MMWD and proposed in the Project Narrative.

north of the access drive intersection. Care should be taken during construction to maintain a positive ditch slope and to return the ditch to its pre-disturbance cross-section after the road reconstruction is accomplished.

Based on an interpretation of the likely extent of grading required to provide proper sight distances and the EIR hydrologist’s field inspection, the project could substantially alter the existing drainage pattern and / or obstruct the roadside ditch adjacent to and paralleling Paradise Drive. This alteration could increase the risk of localized flooding along Paradise Drive in the vicinity of the grading and retaining wall construction. This would result in a significant impact on on-site drainage patterns and off-site flooding. Also, care would be required to ensure that the graded hillslope areas were geotechnically stable, and / or were reinforced using retaining walls and that the drainage ditch segments were cleared of any loose material and returned to their previous cross-sections and slopes prior to the following rainy season.

**Mitigation Measure 5.5-2** The applicant shall implement the following mitigation measures in order to reduce the project’s impacts on on-site drainage patterns and off-site flooding along Paradise Drive to less-than-significant levels:

- Following the completion of hillslope grading and retaining wall construction for sight distance improvement, clear stormwater ditch segments along Paradise Drive of extraneous cut material and return ditch cross-sections, slopes and drainage directions and hydraulic capacities to pre-disturbance conditions. Ensure that road culverts are not buried or obstructed by excavation debris.

**Significance after Mitigation** Implementation of Mitigation Measure 5.5-2 would reduce project sight-line grading impacts on Paradise Drive drainage patterns and flooding to a less-than-significant level.

**Responsibility and Monitoring** The Marin County Department of Public Works would be responsible for inspection of the sight distance grading at project intersections with Paradise Drive, to ensure that roadside drainage ditches remain unaltered. If debris from the grading work enters the ditches, the applicant and its contractor(s) would be responsible for removing any material from the ditches to preserve their existing slopes and cross-sections, as well as to minimize the extent of roadway culvert obstruction and / or sedimentation.

**Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation**

Construction of impervious surfaces and storm drain systems in the site’s watersheds would alter site drainage patterns, concentrate stormwater runoff, increase peak flow rates in on-site drainageways and increase the risk of incision and instability in receiving drainageways and on hillslopes. In addition, grading of lots and roads and installing utilities would disturb areas of the site and expose bared soil surfaces to the erosive forces of rainfall and runoff. This could result in downstream sedimentation and obstruction of hydraulic structures (culverts and catch basins), as well as increase the risk of sedimentation in Keil Pond and Railroad Marsh. These would be significant erosion and sedimentation impacts.

As discussed above under Peak Flow Assessment, detention facilities would be incorporated throughout the project site to capture and detain increases in peak flow rates from the ten-year to 100-year storm event. Detention of these relatively infrequent, major storm events would reduce the likelihood of increased erosion of site hillslopes and drainageways from project construction. However, the more frequent, less intense storm events (i.e. less than the ten-year storm) would produce increases in peak flow rates that would not be necessarily detained by the proposed detention
facilities. Release of concentrated undetained stormwater from events up to the ten-year storm event onto site hillslopes and into site drainageways has the potential to increase slope and channel erosion at the point of discharge and downstream. In the east facing drainageways eroded sediment would likely be transported through the culverts under Paradise Road and onto the Keil property, with the potential to enter Keil Pond. Any eroded sediment from the portion of the site above the western drainageway would likely be transported to Railroad Marsh.

Site grading, topographic modifications (including landslide repair), and construction could extend over a large area of the 110-acre site. The final acreage would depend on the landslide repair methodology developed during the final design stage. Graded areas not paved or occupied by buildings would expose soil surfaces to raindrop impact and erosion via overland runoff. Such erosion could convey sediments downslope to road gutters, storm drain inlets, or ephemeral channels and eventually to Keil Pond, Keil Cove, San Francisco Bay, or Railroad Marsh. It also could disrupt surface drains constructed along remediated landslide terraces. Sedimentation in Keil Pond or Railroad Marsh could increase short-term turbidity levels and reduce water depths over time. Reduced water depths also could have a secondary impact on water quality, increasing water temperatures and biotic productivity. In Keil Pond, sedimentation may increase the extent and/or frequency of pond maintenance.

The additional hillslope grading associated with proposed improvements to sight distance at the site’s two road intersections with Paradise Drive would result in deposition of some cut (or dry ravel) material in Paradise Drive roadside ditch segments (see Impact 5.5-2 On-Site Drainage Patterns – On-Site and Off-Site Flooding for further discussion). If such material were allowed to remain in the roadside ditches, downgradient culvert inlets along Paradise Drive could become obstructed, resulting in reduced stormwater conveyance capacity and possible premature sheet flooding across Paradise Drive.

The PDP’s Stormwater Control Plan consists of a site topographic map with a lot boundary overlay and designated locations for silt fences and jute matting. The Stormwater Control Plan is a combination of a construction stormwater pollution prevention plan (SWPPP) and post-construction Stormwater Control Plan (see Mitigation Measures 5.5-1(a) and 5.5-1(b)). Protection against erosion and sedimentation during construction would fall under measures outlined in a SWPPP. Silt fences would be used to limit the migration of sediments downslope from road and lot areas subject to active construction. Thus, silt fencing would be installed downslope of each road and below each residential structure during construction. Silt fencing would also be installed along parts of the eastern and northern property lines abutting the inside (upslope) edge of Paradise Drive and along the property boundary in the western corner of the site where the property meets the Hill Haven neighborhood and the drainage leading to Railroad Marsh. Jute matting is designated along the edges of site roads but not on the residential lots. The applicant's Stormwater Control Plan does not define further details or erosion control components. For larger residential developments, the Marin County Department of Public Works requires an approved Stormwater Control Plan for each individual lot prior to development, even if the lot is less than one acre in size.  

An effective SWPPP would include details on seeding operations, including seed mix constituents and surface treatments (such as tackifier used with hydroseeding operations, straw mulch, or other materials designed both to guard against soil detachment by rainfall and to reduce its transport in runoff). If these physical processes are not addressed adequately, silt fences can be overwhelmed and

29 See Marin County Stormwater Pollution Prevention Program (MCSTOPPP) web site under the heading “Construction Resources”, http://mcstoppp.org/aepresources.htm.
fail under severe sediment loading. Further, installation of silt fencing often is of variable quality which also can increase the number and significance of localized failures. A schedule should be included indicating seasons / dates for seeding, for installing surface treatments, and for planting trees, seedlings, and shrubs. Timing and sequencing of construction operations are critical in implementing an effective erosion control program. Specific attention should be paid to the construction road when preparing the SWPPP. Measures would need to be included that address removal of sediment from construction vehicles prior to leaving the project site. It is important to include details on the proper washing of vehicles to ensure that sediment is captured and disposed of properly. In addition, adequate dust control measures need to be specified for both the construction road (when being built and when used during site construction) and any area disturbed by construction activities that may pose dust control issues.

Site construction has the potential to substantially alter the existing site drainage pattern of the site or area through the concentration and re-direction of stormwater runoff in a manner that would result in substantial on-site erosion of hillslopes and drainageways and downstream sedimentation. The potential of on-site erosion and downstream sedimentation stemming from site construction and modification would be a significant impact.

**Mitigation Measure 5.5-3** The applicant shall implement the following mitigation measures in order to reduce the project’s erosion and downstream sedimentation impacts to less-than-significant levels:

**Mitigation Measure 5.5-3(a)** The applicant shall implement Mitigation Measure 5.5-1(a) which includes applying for coverage under the NPDES Construction General Permit for construction activities that disturb more than one acre. The applicant shall add a provision to the project’s CC&Rs stating that the Property Owners’ Association would be responsible for ensuring that the developer of each lot be required to meet all conditions specified in the General Permit. This would ensure that appropriate erosion control and water quality mitigation measures are implemented at the time each lot is developed.

**Mitigation Measure 5.5-3(b)** The applicant shall implement Mitigation Measure 5.5-1(a), which requires the applicant to prepare a Stormwater Pollution Prevent Plan (SWPPP), and Mitigation Measure 5.5-1(b), which requires the applicant to prepare a stand alone Stormwater Control Plan. The SWPPP would include specific measures to reduce the potential for erosion and downstream sedimentation during construction, paying particular attention to the construction road. The Stormwater Control Plan shall include specific measures to reduce the potential for erosion and downstream sedimentation once the project is constructed. See Mitigation Measures 5.5-1(a) and 5.5-1(b) for additional information regarding the necessary measures to reduce the potential for erosion and sedimentation during construction and after project completion.

**Mitigation Measure 5.5-3(c)** Any areas receiving point discharge from subdrains or detention facilities shall be protected by means of appropriately sized rip rap receiving pads and / or velocity reducers to control the discharge and protect against slope erosion. A geomorphic evaluation shall be conducted for each point discharge location to ensure that increased peak flow rates, up to the ten-year storm event, would not impact hillslope or drainageway stability at the point of discharge and downslope / downstream. Rip rap may be required around bubble-up boxes to prevent erosion. Level spreaders shall be installed with as little disturbance of downslope areas as possible and installed in a manner to ensure proper distribution of flow across the spreader. Due to the steep site

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30 The ten-year pre-project peak flow rate at each discharge point would be maintained for the ten-year to 100-year post-project design storm.
slopes leading down to and below the proposed location of level spreaders, the level spreaders would likely need to be composed of a pipe with evenly placed weep holes drilled through the pipe. The spreader pipe would be placed on contour for even discharge onto the hillslope. Maintenance procedures for clearing sediment from the spreaders shall be established and transferred to the Property Owners’ Association for its reference in maintaining these erosion control measures.

**Mitigation Measure 5.5-3(d)**  Implement Mitigation Measure 5.5-2 to ensure the drainage integrity of inslope roadside ditch segments along Paradise Drive following the completion of hillslope grading for sight-line improvement.

**Mitigation Measure 5.5-3(e)**  For final design of site stormwater runoff detention facilities, position the outlet to provide a runoff storage volume sufficient to mitigate for the volume differential between the pre- and post-development, two-year rainstorm, i.e. before any outlet flow occurs. This feature would expand the detention function, but would not substantially change the overall design of the structure, since the outlet capacity would remain the targeted ten-year, pre-development peak flow and the total volumetric storage would satisfy the 100-year storm requirement.

**Significance after Mitigation**  Implementation of Mitigation Measure 5.5-3 would reduce the project’s impacts on erosion and downstream sedimentation to a less-than-significant level. The measure’s provisions also would ensure incorporation of the best practical measures for site erosion control.

**Responsibility and Monitoring**  Due to the Phase II NPDES Municipal Stormwater Permit regulations, including Attachment 4, the County requires the applicant to prepare a SWPPP that will include an Erosion and Sediment Control plan to address stormwater pollution during construction and a Stormwater Control Plan to address stormwater pollution after construction completion. The applicant must comply with MCC Sections 24.04.625 and 627. The applicant is also responsible for obtaining coverage, by submitting a Notice of Intent to the State Water Resources Control Board, under the NPDES General Construction Permit for stormwater discharge. This permit will also require that the applicant submit a SWPPP to the California State Water Resources Board. The applicant shall submit a copy of the Notice of Intent to the County as required by MCC Section 24.04.627(b). The applicant would be responsible to prepare stand alone SWPPP and Stormwater Control Plan documents. The applicant also would be responsible to obtain coverage under and comply with the NPDES Construction General Permit for stormwater discharge and MCC Section 24.0462. The Marin County Department of Public Works would be responsible to review and approve the Stormwater Control Plan. The Regional Water Quality Control Board (RWQCB) would be responsible to review and approve the SWPPP. The applicant, and subsequently the Property Owners’ Association, would be required to fully implement the erosion control and other water quality measures cited in the SWPPP and Stormwater Control Plan, and to monitor and maintain these measures during and following completion of site buildout, as necessary. The RWQCB would be responsible to inspect these measures, typically on an annual basis, for all components of the proposed project while the applicant (or Property Owners’ Association) would be responsible to implement any remedial measures if the RWQCB indicated that site stormwater quality objectives were not being met. The County also would be responsible for inspection during construction of BMPs and erosion control measures. The Property Owners’ Association would be responsible for ongoing operations and maintenance of permanent BMPs including structural or treatment control BMPs. The POA shall provide verification provisions through such means as may be appropriate [MCC Section 24.04.627(g)].
All landslide repairs and maintenance of hydrologic measures would be included in the Geologic Hazard Abatement District (GHAD) (see Mitigation Measure 5.4-9), and thus, subject to long-term monitoring.

**Impact 5.5-4  Groundwater Recharge and On-site Hydrology**

Landslide repair or improvements required to stabilize existing landslide deposits could impact three seeps in Watershed J, one seep and a seasonal pond in Watershed L, the seep on the north side of Drainageway 1 in Watershed E, and the spring in Watershed C, by reducing or eliminating the seasonal extent of groundwater recharge to these features. In addition, the lower reaches of Drainageways 2 and 3 may be dewatered through the installation of subdrains below the drainageways as part of the proposed landslide stabilization measures. Changes in the seasonal hydrology (i.e. duration and extent) of these on-site hydrologic features, while potentially detrimental to on-site wetland features, would result in less-than-significant impacts to on-site hydrology.

Measures utilized to stabilize on-site landslides would dewater the repair area, accelerating the conversion of groundwater to surface water. Depending on the locations of the return surface flows relative to the affected features, such landscape alterations could reduce the seasonal extent to which groundwater is available to recharge site seeps, the spring and the seasonal pond. The affected springs would include the mapped spring at the head of the Railroad Marsh tributary channel, on Lot 8. The locations of landslide remediation measures are shown in Exhibit 5.4-3, however, the true extent of the necessary repairs both vertically and laterally would not be known until more detailed studies are completed and the repair work occurs. The applicant's engineering geologist or geotechnical engineer would be present during the installation of slope stabilization measures in order to determine the required repair extent. In addition, Exhibit 5.4-3 is conceptual in that it only shows the location and type of landslide repairs and does not show the full extent of where and how stand-alone subdrains and subdrains associated with the remove and replace repairs and buried drilled pier and grade beam walls will daylight downslope of the repair areas.

Improper daylighting of subdrain lines could result in erosion and downstream sedimentation along on-site drainageways. Furthermore, the proposed landslide remediation measures (see Exhibit 5.4-3) show that subdrain lines would be installed beneath the lower reaches of two of the drainageways (Drainageways 2 and 3), just upslope of Paradise Road, where in-stream surface water is persistent the longest following the rainy season. Installation of subdrains below these principal drainageways may result in dewatering of the channels when flows are low enough that the subdrain capacity is not exceeded. This would typically occur during the onset of winter as soils are becoming wet and in spring as site soils begin to dry. While project improvements would adversely influence the existing natural hydrology of site seeps, springs, the seasonal pond and Drainageways 2 and 3, the lowering of local, shallow groundwater levels would be spatially limited. Groundwater extracted by subdrain systems associated with landslide repairs would be returned to the dewatered hillslopes and drainageways downgradient, but not significantly downgradient, of the points of extraction / diversion. Thus, these project modifications would not substantially decrease local groundwater recharge or groundwater levels, and therefore, would result in less-than-significant impacts. However, these project effects on local groundwater recharge and groundwater levels could have secondary impacts on jurisdictional wetlands. For a discussion of these potential secondary impacts, see Impact 5.6-5 Disturbance to Jurisdictional Waters.

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31 Because Keil Spring is an in-holding within the project site it is considered an off-site hydrologic feature and impacts to Keil Spring are discussed in Impact 5.5-5 Groundwater Recharge and Off-Site Hydrology and in Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-Based Water Supply.
Mitigation Measure 5.5-4  No mitigation would be required.

Impact 5.5-5  Groundwater Recharge and Off-Site Hydrology
Landslide repair and improvements required to stabilize existing slopes for the construction of homes could result in impacts to springs and seeps at the project site and/or conversion of site groundwater to surface water. The addition of impervious surfaces in the form of pavement and roof coverage would eliminate areas of existing groundwater recharge and increase local peak flow rates and surface runoff volumes. These potential impacts would reduce the discharge of off-site seeps and springs, including Keil Spring, and lower local groundwater tables, including those on the Keil property. Aside from the direct impacts to the Keil spring-based water supply (see Impact 5.5-6. Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply), the conversion of areas of potential groundwater recharge to areas of surface water runoff and the lowering of groundwater levels that regulate groundwater flow to Keil Spring and the Keil property would not substantially alter the character or pattern of groundwater and surface water flow. Therefore, the project would result in a less-than-significant impact on groundwater recharge and off-site hydrology.

The applicant’s geotechnical consultants recommend repair of specific landslides and/or portions of landslides on and near proposed residential lots and associated infrastructure (see Section 5.4 Geology and Soils and Exhibit 5.4-3). The recommended method of landslide repair, referred to as “remove and replace”, includes excavation of the repair area, installation of subdrains and recompaction of earthen fills. Remove and replace repairs are proposed in the vicinity of Lots 9, 10, 11, 17, 18, 19, 21, 22, 23, 37, 40, 41, 42, and 43, and at the upper end of the construction road where it would meet Mt. Tiburon Court. Buried drilled pier and grade beam walls with associated subdrains, and stand alone subdrains have also been specified to stabilize landslides where the applicant's geotechnical engineer has not required the more intensive remove and replace repair. Buried drilled pier and grade beam walls are proposed in the vicinity of Lots 11, 12, 13, 14, 15, 16, 28, and 31. Stand alone subdrains are proposed as the repair method for various on-site landslides and near Lots 8, 15, 23, 26, and 27. All three landslide stabilization components (i.e. remove and replace, buried drilled pier and grade beam walls with associated subdrains, and stand alone subdrains) would be installed to dewater existing landslide deposits and to prevent further movement. The remove and replace and buried drilled pier and grade beam walls repair methods also would provide structural stabilization. While the locations of landslide remediation are shown, the true extent of the necessary repairs both vertically and laterally would not be known until the repair work takes place. During construction the applicant's engineering geologist would be present to determine the required repair extent of slope stabilization measures. In addition, Exhibit 5.4-3 is conceptual in that it only shows the location and type of landslide repairs and does not show the full extent of where and how stand-alone subdrains and subdrains associated with the remove and replace, and buried drilled pier and grade beam walls would daylight downslope of the repair areas (see Section 5.4 Geology and Soils).

Dewatering of landslide deposits for stabilization purposes would result in a more rapid conversion of groundwater to surface water and would interfere with groundwater recharge. This process occurs through the capture of infiltrated water by means of subdrains which direct the subsurface water to downslope outlets at the ground surface. Because subdrains efficiently capture and remove groundwater, the quantity and seasonal extent of groundwater that is available to discharge to the surface through seeps and springs would be decreased and possibly eliminated in some locations.
Installation of Retaining Wall 11, as shown on the Precise Development Plan, Wall Plan & Profile, along the upslope side of the driveway extension to Lots 7 through 9 would intercept shallow groundwater and convert it to surface water via collection in the retaining wall foundation drain. Collection of groundwater via the retaining wall drains would reduce the amount of groundwater available to the downslope seep that contributes seasonal flow off-site to the ephemeral tributary in the Railroad Marsh Watershed. Reduction in the quantity of groundwater available to the seep could reduce the seasonal duration and magnitude of the seep discharge, as well as discharge in the upper reach of the Railroad Marsh tributary.

Although the landslide remediation measures are site-specific repairs and not a full-scale repair of entire landslide extents, and detention facilities, dispersion devices and infiltration trenches have been proposed to mimic natural site hydrology, the project would affect some changes to the groundwater and surface water flow regimes on the Keil property. These impacts would occur as the result of the construction of impervious surfaces and retaining walls and their internal drainage systems within the project site, and would affect both a decrease in local groundwater recharge and a conversion of groundwater to piped flow. The applicant’s groundwater investigation did not accurately delineate the recharge zone for Keil Spring, and the location of rock fracture networks feeding Keil Spring are uncertain with regard to both density and location. Thus, the construction of impervious surfaces (e.g. roads, driveways and rooftops) cannot reliably be mitigated by engineered infiltration systems as proposed.

While there is no precise design showing subdrain daylight locations, standard engineering practice would be to pipe drain water to one of the site’s many drainageways or swales, or to insloped roadside ditches along Paradise Drive. Conversion of captured groundwater to surface water via the processes described would create conditions that have the potential to reduce the on-site recharge of groundwater, which would reduce groundwater discharge downgradient on the Keil property. The Keil property's two cisterns receive groundwater inflow from upslope areas on the project site. The proposed landslide repairs and the associated groundwater conversion would reduce seasonal groundwater discharge to the cisterns. For a more detailed discussion of project impacts to the Keil property water supply, including Keil Spring and the off-site underground cisterns that receive direct groundwater discharge, see Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply.

Aside from the direct impacts to the Keil spring-based water supply (see Impact 5.5-6. Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply), the conversion of areas of potential groundwater recharge to areas of surface water runoff and the lowering of groundwater levels that regulate groundwater flow to Keil Spring and the Keil property would not substantially alter the character or pattern of groundwater and surface water flow. Therefore, the project would result in a less-than-significant impact on groundwater recharge and off-site hydrology.

**Mitigation Measure 5.5-5**  No mitigation would be required.

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Impact 5.5-6  Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply

Landslide repair or improvements required to stabilize existing landslide deposits would convert on-site groundwater to surface water. The addition of impervious surfaces in the form of pavement and roof coverage would eliminate areas of existing groundwater recharge. These impacts would reduce the available water supply to Keil Spring and the underground cisterns located on the Keil property. A reduction in the available water supply to Keil Spring and/or the cisterns could result in a reduction in the availability of this historic water supply to the Keil property. A reduction in the amount of groundwater discharge from Keil Spring and/or the Keil property cisterns would result in a reduction to this historically relied upon groundwater supply for irrigation of historically significant gardens and would result in a significant impact.

A Supplemental Groundwater Investigation (Investigation) was prepared for the applicant by Questa Engineering Corp. The EIR hydrologist conducted a peer review of the Investigation. The Investigation was directed specifically at the Keil Spring source area and not the source areas for other seeps and springs located on the project site. In 2002, six piezometers were installed to investigate the hydrogeology and groundwater conditions in the vicinity of Keil Spring. The ultimate aim of the Investigation was to delineate the Keil Spring recharge area. Bail testing was conducted at each piezometer to determine in-situ estimations of the hydraulic conductivity at each piezometer. In addition, the Investigation states that water samples were taken from four of the six piezometers and two separate hose junctions from the line that conveys spring water to the Keil property. However, Table 2 of the Investigation only provides the results for three of the piezometers and the two hose junctions. Of the three piezometers, two are upslope of Keil Spring and one is downslope. All three piezometers are within 200 feet of Keil Spring. The hose junction sample locations were immediately downslope of Keil Spring and just upslope of where the spring line passes through a culvert beneath Paradise Road.

In addition to Keil Spring, the Investigation documented a second collection box at a seep located in Watershed J (see Exhibit 5.5-1). The Investigation report speculated that the seep may be a spring covered by colluvium. Springwater collection line flow rates were measured at various times during 2002 to document flow from the Keil Spring and the second collection box located approximately 600 feet to the southeast of Keil Spring. The Investigation found that collected flow from the second collection box was negligible by late August, with only Keil Spring contributing flow to the spring line through fall.

Water samples taken from the three piezometers and two hose junctions described above differed in their mineral content. The three piezometer water samples had much higher concentrations of sodium, chloride, iron and manganese than the spring line samples. The Investigation concluded that the high mineral content of the piezometer water samples was indicative of the chemical leaching processes that typically occur as groundwater moves slowly through the Franciscan formation mapped at the site, which partially consists of highly sheared sandstone and shale rock types. In contrast, the low mineral content of the spring line water samples stemmed from groundwater movement through rock fractures where the opportunity for leaching of minerals is reduced due to reduced contact time between groundwater and the mineral constituents within the rock, and/or the rock type through which the groundwater moves prior to reaching the surface at Keil spring. Although no chert was encountered in any of the piezometer borings, the Investigation speculates that Keil Spring waters may emanate from a zone of fractured chert, since chert is a very hard rock type resistant to chemical breakdown and leaching, and contains low concentrations of sodium, chloride, iron and manganese. The Investigation speculates further that Keil Spring emanates from a zone of fractured chert, since

34 Ibid.
outcrops of highly fractured chert have been identified on the Tiburon Peninsula, specifically along the ridge located upslope of Keil Spring.

The *Investigation* was not able to definitively identify the recharge area for Keil Spring. However, the probable source area was inferred from site topography and the information outlined above. The *Investigation* speculated that the recharge area for Keil Spring is along the spur ridge and the knoll area northwest and north of the Keil Spring, roughly in the area of Lots 36 through 42, and probably continuing farther north off the project site along the ridgeline. The actual source of the water is likely a combination of seepage through bedrock fractures and perched water within adjacent landslide deposits.

Construction of impervious surfaces at the site, including roads, roofs, patios, etc., would obstruct areas where rainwater has the opportunity to infiltrate under existing conditions. The applicant has proposed the installation of detention facilities with metered outflow to a number of flow dispersion devices and velocity reducers including: level spreaders, infiltration trenches, bubble-up boxes, and rip rap pads, located throughout the site. The main purpose of the detention facilities would be to reduce impacts on peak flow rate increases under the post-project condition, however, the level spreaders and infiltration trenches also provide some means for reducing impacts to groundwater recharge. These devices would provide the opportunity for captured surface water to be converted to groundwater. However, since the area for the concentrated flow to infiltrate would be greatly reduced, the quantity of rainwater that could infiltrate under existing conditions would likely be reduced after buildout.

To mitigate for increased impervious surface construction throughout the site, and specifically over the groundwater recharge area upslope of Keil Spring, the applicant's civil engineer has proposed the incorporation of grass swales into the conceptual grading plans for all the lots. Depending on the geotechnical constraints at each lot, the grass swales would allow for some retention and infiltration of development area runoff. In an *Addendum to the Supplemental Groundwater Investigation (36)* Questa Engineering Corp. recommended that Mt. Tiburon Court road runoff in the vicinity of Lots 36 through 42 (i.e. the potential recharge area to Keil Spring) be directed toward infiltration areas. Questa suggested the use of grass lined V-ditches, small retention basins, infiltration trenches and/or use of permeable pavement. The applicant's geotechnical engineer recommended the use of an asphalt-concrete street surface along Mt. Tiburon Court, with road runoff directed toward an infiltration trench along the edge of Mt. Tiburon Court to allow for groundwater infiltration in the Keil Spring recharge area. Although this type of road/infiltration trench scenario should be feasible (the area adjacent to Mt. Tiburon Court in the vicinity of Lots 36 through 42 is relatively flat), infiltrated water would be captured via downslope landslide repair areas. This is also true for the lot-specific grass swales that may be constructed upslope of landslide repair areas. A key objective of repairing unstable slopes is to dewater the area via the installation of subdrains (see *Section 5.4 Geology and Soils*). Therefore, any water sent to infiltration areas upslope of a landslide repair area would be captured prior to entering the repair area and reconverted to surface water.

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35 Lot Specific Conceptual Grading Plans, 43 sheets (G-1 to G-43), Land Development Solutions, Inc., January 2009.


37 Geotechnical response to Comment #22 of the Marin County Community Development Agency's comments for Easton Point Subdivision, dated January 27, 2009.
The Keil property has relied on water from the Keil spring and the Keil property cisterns since the 1890’s. Use of this historic water supply has provided summer irrigation and allowed for the development of a mature garden now preserved and registered with the Garden Conservancy. The irrigation season typically lasts from May to September. Over the years the Keil property has continually relied upon Keil Spring and groundwater collected in the properties cisterns for irrigation. No records have been kept on consumptive use of these irrigated gardens and landscaping, nor of the volume of water received from upslope sources. Any impact to the groundwater supply of Keil Spring or the Keil property cisterns that would reduce dry season discharge from these sources would affect the ability of the Keil property to maintain the historically significant gardens and would be a significant impact.

Mitigation Measure 5.5-6 The applicant shall install a water conveyance system to link the landslide improvement area subdrains to the water storage system on the Keil property. Depending on hydraulic constraints, this converted drain water could be conveyed to either the upslope redwood storage tank or the cisterns. Since all Keil property water system components are linked by piping and pumps, the link could be constructed to the upper redwood storage tank. Implementation of this mitigation measure would require the agreement and cooperation of the owners of the Keil property.

Significance After Mitigation Implementation of Mitigation Measure 5.5-6 would reduce project impacts to the Keil property cistern and spring-based groundwater supply to a less-than-significant level. Implementation of this mitigation measure would require the agreement and cooperation of the owners of the Keil property. Without the cooperation of the owners of the Keil property to implement Mitigation Measure 5.5-6, the project impact on these spring-based groundwater supplies would be a significant unavoidable impact.

Responsibility and Monitoring The applicant would be responsible to coordinate, design, and fund the installation of piping water conveyance system linking the on-site subdrain systems within the watersheds tributary to the water storage system on the Keil property. The applicant would also be responsible for monitoring the condition of and maintaining the on-site portions of this connective system for as long as the irrigation system and pond on the Keil property rely on this historic source of water.


39 Ibid.
**Impact 5.5-7 On-Site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection**

Construction of impervious surfaces would increase the rate and quantity of runoff leaving the project site. Future development of individual lots would add additional impervious surfaces to the project, increasing peak flow rates conveyed off-site by the culverts beneath Paradise Road and in the storm drain system beneath the Hill Haven neighborhood. Uncontrolled increases in peak flow rates would result in potentially significant impacts. The applicant has prepared a Drainage Report proposing the use of detention facilities to maintain pre-project peak flow rates for design storms equal to or greater than the ten-year recurrence interval storm, eliminate potential impacts to existing and downstream storm drain capacities, and protect against downstream flooding. However, the proposed facilities would not mitigate for increases in peak flow or runoff volumes associated with storms of lesser recurrence intervals (e.g. two-year storm). These lower magnitude, yet significant, storm events are geomorphically important and can trigger adjustments in the dimensions of receiving drainageways via channel scour. Thus, project impact on on-site peak flow rates, existing drainage structures and downstream flooding would remain significant, even with implementation of the detention measures included in Drainage Report.

As described above in the Peak Flow Assessment, the applicant's civil engineer prepared a Drainage Report and associated calculations to document pre- and post-project peak flow rates and detention volumes required to maintain pre-project peak flow levels. The EIR hydrologist conducted a peer review of the document and calculations, and completed separate calculations for peak flow rates and detention facility sizing. The results of these calculations are presented in Exhibit 5.5-3. The detailed calculations and a summary of the methodology are contained in the Appendix. As described in the Drainage Report, detention facilities have been sized to store the volume differential between the pre-and post-project 100-year design rainstorm. The stored differential would then be slowly released, by use of a metering device such as an orifice, at no greater than the ten-year, pre-project peak flow rate. The detention facilities would serve this attenuating function for storms with recurrence intervals between ten and 100 years.

During the final design phase of the project drainage system, detention facility outlet controls (e.g. orifices) would be sized to meet the ten-year pre-project peak flow release requirement. Outlet controls cannot be sized until the dimensions of the detention facilities are known, since outlet sizing is a function of detention facility dimensions.

A prior study has shown that not all of the culverts below Paradise Road are sufficiently sized to pass the existing 100-year peak flow. However, since the 100-year post-project peak flow rate would be reduced to the ten-year, pre-project level from the developed subwatershed areas, peak flow rates to the culverts under Paradise Road would not change from existing conditions, and in some instances would be reduced.

As noted in the above discussion under Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation, the broadly defined detention facilities suggested in the Drainage Report would not necessarily mitigate for any increases in peak flows for lesser rainstorms, i.e. less than ten-year events. Post-development increases in peak flow rates and flow volumes during these more frequent runoff events could trigger channel changes, including incision and bank instability/channel widening. Such channel adjustment would yield increased quantities of sediment downstream, possibly obstructing Paradise Drive culverts and reducing their capacities. This could increase the likelihood of localized sheet flooding over Paradise Drive, which would constitute a significant impact.

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Mitigation Measure 5.5-7  Implement Mitigation Measures 5.5-3(c) (d) and (e) to minimize increases in peak flows and runoff volumes during rainstorms with two-year to ten-year recurrence intervals, and / or to minimize the risk of drainageway instability, downstream sedimentation, culvert blockage and local flooding.

Significance After Mitigation  With implementation of Mitigation Measure 5.5-7, project impacts on peak flow rates, existing storm drain capacities and flooding would be reduced to a less-than-significant level.

Responsibility and Monitoring  Marin County would be responsible to conduct design review for site detention facilities and to monitor their installation during the progressive implementation of project development.
5.6 BIOLOGICAL RESOURCES
5.6 BIOLOGICAL RESOURCES

INTRODUCTION

This section describes the biotic resources of the project site and evaluates the potential impacts that the proposed project may have on such resources. The 110-acre site is located at the eastern tip of the Tiburon Peninsula in unincorporated Marin County adjacent to Paradise Drive (see Exhibits 3.0-1 and 3.0-2). It is contiguous to the Town of Tiburon’s boundary on the south and west. The site is surrounded by residential development to the north, south, and east; and by undeveloped land preserved as permanent open space to the west. It is located on the U.S. Geological Survey (USGS) 7.5 minute San Quentin quadrangle.

Focus of the Analysis

While no Initial Study was prepared by Marin County for this EIR effort, an Initial Study was prepared by the Town of Tiburon in May 2000 for the 2001 Draft EIR. The 2000 Initial Study for that prior project determined that the project would result in potentially significant impacts on biological resources and focused the scope of the EIR on special-status species and their habitats, other sensitive natural communities, wetlands, interference with wildlife movement or use of the site, and conflicts with local policies and ordinances adopted to protect biological resources. During the scoping process for the 2001 Draft EIR, the Town of Tiburon also received numerous public comments raising concerns about impacts to an invertebrate spider, the Tiburon micro-blind harvestman (Microcina tiburona), and a condition involving the affliction and killing of native oak trees (commonly referred to as “sudden oak death syndrome” (SODS)).

Field surveys conducted for the Town of Tiburon in 1995-1996 did not locate the Tiburon micro-blind harvestman on the site. The federal government listed it as a Candidate 2 species at the time of the field surveys, but the species did not have any special status designation in 2001, nor does it presently have any special status designation. Nonetheless, the scope of the 2001 Draft EIR was expanded to review relevant information about this invertebrate, the site, and investigations conducted nearby to determine the potential impacts of the project on this species. A habitat assessment for the harvestman was subsequently conducted on the site by the EIR entomologist. It was concluded that the project would have no impact on this species as none were detected on-site. Due to the prior finding that detected no harvestman on the site, as well as the fact that this species does not currently have any special status designation, this species has been eliminated from consideration in this Draft EIR.

Numerous public scoping comments for the 2008 Easton Point Residential Development project were received by Marin County in February 2009 with regard to biological resources. Concerns raised by the public during the scoping process were focused on potential impacts to the federally-threatened California red-legged frog (Rana aurora draytonii) (CRLF) both on-site and in Keil Pond located downstream and to the east of the project site; to special-status plants including the Marin dwarf flax (Hesperolinon congestum), Tiburon Indian paintbrush (Castilleja affinis ssp. neglecta), Tiburon jewel-flower (Streptanthus niger) and serpentine reed grass (Calamagrostis ophitidis); to native plants and animals as a result of the introduction of exotic plants and domestic animals; and to habitats such as oak woodlands and serpentine bunchgrass. Additionally, the public voiced concerns once again about the probable occurrence of SODS on the site and how the project may compound the problem on-site and also in the immediate site vicinity.
Sources for the Analysis

This biological resource analysis was based on the site’s known and potential biotic resources. Sources of information used to prepare this analysis included the California Natural Diversity Data Base (CNDDB), 1 Inventory of Rare and Endangered Vascular Plants of California, 2 and analyses conducted in 2000 for the 2001 Draft EIR by Live Oak Associates, Inc. (the EIR biologists) and in 1995-1996 by H. T. Harvey & Associates. 3 In addition, the EIR biologists also revisited past surveys conducted for the applicant by their consultants for the prior 1999 Easton Point Precise Development Plan and the 2001 Draft EIR by CSW/Stuber-Stroeh 4 and by RMI and LSA, 5 for the Keil property owner by Sycamore Associates, 6 and for the Town of Tiburon. 7 Also reviewed were the original tree survey report 8 and updated tree survey report 9 prepared for the applicant by their consultant. The analysis was also based on more current studies conducted on the site and in the site’s vicinity in 2009 for this Draft EIR by Live Oak Associates (the EIR biologists), described in greater detail below.

Field surveys of the project site were conducted by the EIR biologists 10 on June 27, 2007; and on April 6 and 16, May 12 and 18, and June 10, 2009. During the site surveys, LOA confirmed the existing conditions and locations of previously identified habitats on-site and noted the constituent plants and animals observed in each habitat. These surveys also included formal site-specific surveys for special-status plants, most notably for both the Marin dwarf flax (state- and federally-threatened) and serpentine reed grass (CNPS List 4) known to occur on the site, and also for several other special status plants known to occur in the immediate vicinity of the site, including, but not limited to, the Tiburon jewelflower and Tiburon Indian paintbrush. During the June 10, 2009 site survey, EIR biologists also collected data to supplement findings of the applicant’s arborist with regard to the current health status of trees and oak woodland habitats on site. Lastly, a site visit was conducted by the EIR biologist to the Keil property on March 19, 2009, as a result of scoping comments raising concerns about possible project impacts on downstream waters and on CRLF known to be present in Keil Pond.

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1 California Natural Diversity Data Base, California Department of Fish and Game (CDFG), 2009.
2 Inventory of Rare and Endangered Vascular Plants of California, California Native Plant Society (CNPS), 1994.
3 Live Oak Associates biologists, Alisa Durgarian, Rick Hopkins PhD, Mark Jennings PhD, and Ray White PhD were among the H.T. Harvey & Associates’ personnel who performed biological analyses for the Town in 1996.
4 Easton Point Tree and Rock Outcrop Survey Point Description Listing, October 1, 1999.
7 Easton Point Prezoning, Precise Development Plan, Annexation Draft EIR, Nichols • Berman, 1996.
10 Live Oak Associates’ Associate Ecologist Pamela Peterson and Associate Botanist and Arborist Neal Kramer conducted 2009 field surveys of the site.
The project site topography is generally characterized as rolling to steeply hilly. Elevations range from about 100 feet NGVD\(^{11}\) along Paradise Drive on the southern end to nearly 600 feet at the crest of the western site boundary. According to the 1985 *Soil Survey of Marin County*, two soil types are found on-site: Henneke stony clay loam (15 to 50 percent slopes) and Tocaloma-McMullin complex (30 to 50 percent slopes). Henneke stony clay loam is derived from serpentinite, is shallow and somewhat excessively drained, and about half the surface typically is covered with stones. Tocaloma-McMullin soils are derived from sandstone or shale, have fractured bedrock below about 18 inches, and are moderately deep and well drained. See *Section 5.4 Geology and Soils* for a detailed description of the geology of the site.

Annual precipitation at the site is 22 to 23 inches. Virtually all precipitation falls in the form of rain, and almost 85 percent falls between November and April. Stormwater runoff readily infiltrates site soils, but when field capacity is reached gravitational water collects in drainage swales which ultimately empty into San Francisco Bay. See *Section 5.5 Hydrology and Water Quality* for a more detailed description of the hydrology of the site. Average annual temperatures range from 54 to 56 degrees Fahrenheit.

**Biotic Habitats**

Seven biotic habitats occur on the site. These include non-native grassland (serpentine and non-serpentine), serpentine bunchgrass, coast live oak woodland, northern coyote brush scrub, freshwater wetland / aquatic, and developed. *Exhibit 5.6-1* shows the amount of project site area occupied by each habitat type in acres and percent. *Exhibit 5.6-2* shows the habitat locations on the site. A list of vascular plants observed growing on the site is presented in the Appendix.

**Exhibit 5.6-1**

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Acres</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coast Live Oak Woodland</td>
<td>47.71</td>
<td>43.37</td>
</tr>
<tr>
<td>Non-Native Grassland (non-serpentine)(^{c})</td>
<td>38.70</td>
<td>35.18</td>
</tr>
<tr>
<td>Serpentine Bunchgrass Marin Dwarf Flax Serpentine Reed Grass</td>
<td>11.31</td>
<td>10.28</td>
</tr>
<tr>
<td>Non-Native Grassland (serpentine)</td>
<td>0.85</td>
<td>0.77</td>
</tr>
<tr>
<td>Northern Coyote Brush Scrub</td>
<td>10.33</td>
<td>9.39</td>
</tr>
<tr>
<td>Seasonal Wetland / Aquatic</td>
<td>0.94</td>
<td>0.85</td>
</tr>
<tr>
<td>Developed</td>
<td>0.16</td>
<td>0.16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>110.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

\(^{a}\) This acreage estimate excludes the Lands of Keil and MMWD parcels surrounded by the site.

\(^{b}\) Acreage was calculated by the EIR biologist based on PDP CAD files provided by the applicant. In some cases the acreages differ slightly from those stated by the applicant.

\(^{c}\) Includes areas designated in *Exhibit 5.6-2* having a significant component of native grasses.


\(^{11}\) National Geodetic Vertical Datum (NGVD), equivalent to 1929 Mean Sea Level (MSL).
Coast Live Oak Woodland  Coast live oak habitat dominated by coast live oak (*Quercus agrifolia*), California bay (*Umbellularia californica*), toyon (*Heteromeles arbutifolia*), California buckeye (*Aesculus californicus*), and madrone (*Arbutus menziesii*) covers 47.71 acres, or about 43 percent, of the site. It typically is found on north and east facing slopes. Within most of this habitat, the canopy is too dense and the leaf litter too thick to allow for the development of complex understory layers such as herbaceous or shrub layers. However, in areas with less dense canopy cover, some understory plants species were observed including poison oak (*Toxicodendron diversilobum*), bracken fern (*Pteridium aquilinum*), and snowberry (*Symphoricarpos albus*).

In 1995, tanoaks (*Lithocarpus densiflorus*) were reported dying in large numbers in Mill Valley, Marin County.12 The die-off of tanoaks had spread countywide and had reached mortality levels of nearly 90 percent in some areas of the county by 1997.13 Subsequently, a large number of coast live oaks and black oaks (*Quercus kelloggii*) also were observed dying from a similar disease agent throughout the coastal regions of California.14 The disease complex was identified by a research team from the University of California and has been referred to as sudden oak death syndrome (SODS). The disease complex includes a fungus of *Phytophthora* and eventual infestation of weakened trees by up to three species of bark and ambrosia beetles.15 Other fungi also may be associated with diseased trees. Researchers have noted that typical symptoms usually include “…brown or black discolored bark on the lower trunk, exudation of reddish-brown to black viscous sap (seeping or “bleeding”) from the bark, the presence of fruiting bodies of the fungus *Hypoxylon thouarsianum*, and fine granular powder resulting from the tunneling activities of up to three species of bark and ambrosia beetles (Coleoptera: Scolytidae)”. SODS has been delimitated as occurring throughout the entire Marin County, including the Tiburon Peninsula. Based on transect data collected within the woodlands on-site by the EIR biologists during 2009 site visits, it is the EIR biologists opinion that SODS likely does occur on the site (although no lab tests were conducted to confirm that conclusion). As many as 25 percent of trees surveyed along the transects showed classic signs of SODS, including the presence of the *Hypoxylon* fungus and weeping.

The mosaic of habitats occurring on the site, and the proximity of the oak woodlands to other habitats (particularly grassland habitats), favor a number of native terrestrial vertebrate species which may require one habitat for cover and another for foraging. The rock outcrops, logs, debris, and tree trunks within the oak woodland attract reptile species such as the western fence lizard (*Scleroporus occidentalis*), Gilbert’s Skink (*Eumeces gilberti*), and southern alligator lizard (*Gerrhonotus multicarinatus*). Furthermore, thick leaf litter and decaying logs provide a moist microclimate suitable for amphibians such as ensatina (*Ensatina eschscholtzii*) and California slender salamander (*Batrachoseps attenuatus*). Gopher snakes (*Pituophis melanoleucus*) and terrestrial garter snakes (*Thamnophis elegans*) are expected to forage here as they do in other habitats of the site.

12 “Sudden Death of Tanoak, *Lithocarpus densiflorus*” P. Svihra, Pest Alert #1, University of California Cooperative Extension in Marin County, 1999.

13 *Fire Hazards Created by Sudden Oak Death in Marin County*, H.S. Rowan, Marin County Fire Department Pamphlet, 2000.


15 Ibid.
Exhibit 5.6-2

Biotic Habitats and Proposed Development

Source: Live Oak Associates, December 14, 2010

Habitats
- Coast Live Oak Woodland
- Serpentine Bunchgrass
- Non-native Grassland (serpentine)
- Non-native Grassland (non-serpentine)
- Non-native Grassland (non-serpentine) with Significant Component of Native Grasses
- Northern Coyote Brush Scrub
- Seasonal Wetland
  - Seep *
  - Spring *
  - Seasonal Pond *
- Marin Dwarf Flax (Hesperolinon congestum)
- Serpentine Reed Grass (Calamagrostis ophitidis)
- Developed
- Areas not included in habitat acreage calculation

Other
- Project Boundary
- Seasonal Drainageway
- Building Sites
- Landslide Repairs
  - Remove and Replace
  - Buried Drilled Pier and Grade Beam Walls
  - Subdrains
  - Debris Fence

Approximate Scale
The diversity and number of birds occurring here would be expected to vary seasonally. Resident species include Stellar's jay (Cyanocitta stellari), northern flicker (Colaptes auratus), and chestnut-backed chickadee (Parus rufescens). Winter migrants could include Townsend's and yellow-rumped warblers (Dendroica townsendi and D. coronata, respectively) and ruby-crowned kinglets (Regulus calendula). Summer migrants breeding here could include orange-crowned warblers (Vermivora celata), black-headed grosbeaks (Pheucticus melanocephalus), and warbling vireos (Vireo gilvus).

Acorns provide an abundant food source for many wildlife species. The California mouse (Peromyscus californicus) frequently feeds on oak acorns and seeds of the California bay laurel. Other constituent mammals of the coast live oak woodland include western gray squirrel (Sciurus griseus) and brush rabbit (Sylvilagus bachmani). Other mammal residents may include gray fox (Urocyon cinereoargenteus), raccoon (Procyon lotor), black-tailed deer (Odocoileus hemoinus columbianus), and bobcat (Lynx rufus).

Non-Native Grassland (Non-Serpentine) This grassland habitat occurs on the upper slopes in the central and southern half of the site and occupies 38.70 acres, or about 35 percent of total site area. This habitat is dominated by a variety of non-native annual grasses including slender wild oats (Avena barbata), soft chess (Bromus hordeaceus), red brome (Bromus rubens), and Italian ryegrass (Lolium multiflorum). Non-native annual and perennial forbs of Mediterranean origin are also prevalent in this habitat including filarees (Erodium botrys and E. cicutarium), fennel (Foeniculum vulgare), bristly oxtongue (Picris echioideae), smooth cat’s-ear (Hypochaeris glabra), shepherd’s purse (Capsella bursapasteris), white sweetclover (Melilotus alba), hairy vetch (Vicia villosa), bindweed (Convolvolus arvensis) and purple sand spurrey (Spergularia rubra). Within this habitat, approximately 12.00 acres includes areas with a significant component of native grasses, including purple needlegrass (Nassella pulchra), melic grass (Melica torreyana and M. californica), and California oat grass (Danthonia californica). While not as prevalent as the non-native grasses and forbs, this habitat does support some native forb species, including red maids (Calandrinia ciliata), yarrow (Achillea millefolium), lupine (Lupinus formosus ssp. formosus), California poppy (Eschscholzia californica), narrow-leaf mule ears (Wyethia angustifolia), soap plant (Chlorogalum pomeridianum), checker mallow (Sidalcea malvaeflora ssp. malvaeflora), and farewell-to-spring (Clarkia purpurea).

All of the on-site grassland habitats are considered to be productive for wildlife, particularly because they are contiguous to a mosaic of adjacent woodland, scrub and wetland habitats. Reptile species tend to be more conspicuous during warmer months of the year, especially near rocks, shrubs, and debris found in this habitat. Species expected to occur in these grasslands include the western fence lizard, western skink, southern alligator lizard, and gopher snake.

Several species of birds use these grassland habitats throughout the year. Savannah sparrows (Passerculus sandwichensis) and western meadowlarks (Sturnella neglecta) may build their nests directly on the ground. Seeds produced by annual and perennial grasses also provide food for migrating and wintering songbirds such as lesser goldfinches (Carduelis psaltria) and white-crowned sparrows (Zonotrichia leucophrys). Raptors of southern Marin County that nest and roost in the woodland habitats also would be expected to forage in these grassland habitats, including white-tailed kites (Elanus caeruleus), red-tailed hawks (Buteo jamaicensis), golden eagles (Aquila chrysaetos), and American kestrels (Falco sparverius). Nocturnal species such as common barn owls (Tyto alba) and great horned owls (Bubo virginianus) also are expected to forage here.

California ground squirrel (Spermophilus beechyi) and Botta's pocket gopher (Thomomys bottae) are more prevalent in this habitat. In addition, California voles (Microtus californicus) and other small rodents use grass seeds and stalks as food sources. These species create runways through the grasses as a result of clipping grasses and herbs at their bases for forage. Black-tailed hares (Lepus
californicus) forage in this habitat as well. Black-tailed deer feed on the various forbs found in this habitat during the spring and early summer. Domestic cats (Felis catus) have been observed on several occasions hunting in this habitat near the developed neighborhood south of the site. Mammalian predators, such as coyotes (Canis latrans) and bobcats (Lynx rufus) hunt for the various small mammals that inhabit such grasslands.

**Non-Native Grassland (Serpentine)** This grassland habitat forms a narrow strip along the southern boundary of the site in the southwest corner adjacent to existing homes and landscaped areas on Mountain View Drive. This habitat type occupies 0.85 acres or about 0.8 percent of the total site area and is dominated by the same non-native grasses which dominate grasslands occurring off of serpentine, including slender wild oats and Italian ryegrass. As the soils underlying this habitat type do not differ from those underlying adjacent serpentine bunchgrass habitats immediately north and west, it appears likely that the hydrologic and chemical/nutrient regime in this area is influenced by its proximity to watered and fertilized off-site neighboring landscaped areas and that these changes have favored the invasion and dominance of this area by non-native grasses and forbs. In the absence of these anthropogenic influences, it is likely vegetation in this area would have been undifferentiated from that of the adjacent serpentine bunchgrass habitat. While this area is dominated by non-natives, it does have a greater proportion of the same native grass and forb species observed to be occurring in the non-serpentine non-native grassland habitat of the site and therefore is considered to have more value as habitat for native plants than the non-serpentine grasslands.

Wildlife using this habitat would be similar to those using other grassland habitats of the site.

**Serpentine Bunchgrass** Serpentine bunchgrass habitat mainly occurs in the southwest portion of the site and occupies 11.31 acres, or about ten percent, of the site. Serpentine habitat supports soils which are high in magnesium and low in calcium and that are often claylike, low in nutrients, and high in heavy metals such as copper and chromium that can be toxic to plants not adapted to such circumstances. As a result, vegetation occurring in these habitats tends to be sparse and stunted in height. Although some non-native grasses such as Italian ryegrass, soft chess and slender wild oats have begun to colonize these habitats in the project region, the unique chemistry of serpentine soils has made such areas generally resistant to invasion by most non-native grasses and forbs that have outcompeted native plants in other grassland communities in California. As a result, these grassland habitats tend to provide a refuge for native grassland plants, including several species which are endemic to these habitats and considered rare. The serpentine grasslands of the site, while supporting the non-native grasses discussed above, are also characterized by having a relative abundance of native perennial bunchgrasses including melic grasses, purple needlegrass, big squirrel tail (Elymus multisetus), California oat grass, serpentine reed grass (Calamagrostis ophitidis), and California fescue (Festuca californica). This habitat also supports a large diversity of native forbs including California plantain (Plantago erecta), purple sanicle (Sanicula bipinnatifida), lomatiums (Lomatium dasycarpum and L. utriculatum), goldfields (Lasthenia californica), Marin dwarf flax (Hesperolinon congestum), California poppy, cream cups (Platystemon californicum), soap plant, butter and eggs (johny-tuck?) (Triphysaria eriantha), Douglas sandwort (Minuartia douglasii), common owl’s clover (Castilleja densiflora ssp. densiflora), herba impia (Filago californica) and cudweed (Gnaphalium californicum).

Within this grassland habitat, scattered serpentine rock outcroppings provide habitat for such native forb species as gold-back fern (Pentagramma triangularis), coast phacelia (Phacelia californica), common phacelia (Phacelia distans), onion (Allium lacunosum), few-flowered collinsia (Collinsia sparsiflora var. sparsiflora), and common dudleya (Dudleya cymosa).

Wildlife using this habitat would be similar to those using other grassland habitats of the site.
Northern Coyote Brush Scrub  Northern coyote brush scrub occurs in several areas on the site and can intermix with coast live oak and non-native grassland habitats as well. The area delineated as coyote brush scrub occupies 10.33 acres, or about nine percent, of the site. This habitat is dominated by coyote brush (Baccharis pilularis), but other shrubs such as California sagebrush (Artemisia californica), toyon, and poison oak also are common. California wild rose (Rosa californica), sticky monkey flower (Mimulus aurantiacus), Himalayan blackberry (Rubus discolor), and the invasive exotic French broom (Genista monspessulana) occur periodically. In areas where this habitat is very dense, there is no understory. In areas where cover is less dense, the same grass and forb species as found in the non-native grassland habitat can be found.

This habitat supports a diverse assemblage of wildlife due to its proximity to other habitats (open grassland habitats and densely forested oak woodlands). A number of reptiles may be expected in this habitat including the western fence lizard, western skink, southern alligator lizard, and Pacific gopher snake.

Birds typically found in this habitat include the scrub jay (Aphelocoma coerulescens), loggerhead shrike (Lanius ludovicianus, a California species of special concern), lark sparrow (Chondestes grammacus), and wrentit (Chamaea fasciata). The common poorwill (Phalaenoptilus nuttallii) and white-throated swift (Aeronautes saxatalis) both feed exclusively on insects captured in the air during foraging flights above this habitat.

Northern coastal scrub of the site provides important habitat for a variety of mammals. Some species such as the deer mouse (Peromyscus maniculatus) and California pocket mouse (Perognathus californicus) forage within the protection of the dense brush. The San Francisco dusky-footed woodrat (Neotoma fuscipes annectens, a California species of special concern) is expected to occur in this habitat, feeding on woody plants and building nests constructed from sticks and leaves at the base of trees, shrubs, or hills. Other mammals that use this habitat include the black-tailed hare, coyote, and bobcat. Black-tailed deer also feed on the new growth of shrubs such as coyote brush, as well as forbs and grasses.

Seasonal Wetland / Aquatic and Seasonal Drainage Channels  Three areas supporting wetland vegetation were identified on the site by EIR biologists during surveys conducted for this Draft EIR and the two previous Draft EIRs prepared for the site. These areas account for a total of 0.94 acres, or slightly less than one percent of the total area of the site. These areas are dominated by herbaceous species such as curly dock (Rumex crispus), horsetail (Equisetum sp.), teasel (Dipsacus fullonum), common monkey flower (Mimulus guttatus), umbrella nut sedge (Cyperus eragrostis), Pacific rush (Juncus effusus ssp. pacificus), and sedge (Carex sp.). Arroyo willow (Salix lasiolepis) can be found adjacent to some of these wetland areas as well. In addition to these three wetland habitats, Clearwater Hydrology (the EIR hydrologist), identified several other hydrologic features on the site during surveys conducted in 1995, 2000 and 2009 (see Exhibit 5.5-1). These latter features include three seeps (one along the boundary of Lot 10, one along the boundary of Lot 14 and one within coyote brush scrub habitat on Parcel A); two springs (one on Lot 8 near the boundary with Old St. Hilary’s Open Space Preserve and one occurring on the Keil parcel centrally located on the project site which is covered by a box and which is piped down to Keil Pond); and one seasonal pond located northeast of the Keil parcel spring. Based on site visits conducted by the EIR hydrologists, the only one of these additional hydrologic features that supported wetland vegetation is the spring along the boundary with Old St. Hilary’s Open Space Preserve, although it is likely that in very wet winters, any one of these features with the exception of the spring on the Keil parcel, may support some wetland vegetation. The seasonal pond that the hydrologist identified was described as a depression that was barren of vegetation likely as a result of occasional seasonal inundation.
Aquatic habitat is found in freshwater wetland areas when these areas are inundated. Vegetation associated with aquatic habitat is the same as is found in freshwater wetland areas.

Five segments of seasonal drainage channels exist on-site representing a total of approximately 4,750 linear feet of channel (see Exhibit 5.5-1). The drainages are identified as Drainageway 1 through 5. These segments vary from approximately 450 feet on Drainageway 4 to more than 1,300 feet for Drainageway 2. Because neither the applicant’s nor EIR’s biologists measured the width of these channels, the acreage which the U.S. Army Corps of Engineers (Corps) may consider jurisdictional has not been estimated.

These wetland habitats provide habitat for a variety of terrestrial vertebrate species. Western toads (Bufo boreas) and Pacific treefrogs (Pseudacris regilla) are expected to breed in these habitats. A few of the birds which potentially occur in this habitat include great blue herons (Ardea herodias), great egrets (Casmerodias albus), red-winged blackbirds (Agelaius phoeniceus), black phoebes (Sayornis nigricans), and belted kingfishers (Ceryle alcyon).

Additionally, wetlands of the site would provide a limited seasonal source of water for wildlife species occurring in surrounding upland habitats.

All of the wetlands and drainages of the site were completely dry during April through June 2009 surveys conducted by the EIR biologists.

**Developed** The Marin Municipal Water District (MMWD) Paradise Water Tank parcel is located on the northeastern portion of the site and has been developed with a water tank. The service road providing access to the tank from Paradise Drive occupies approximately 0.17 acre, or approximately 0.2 percent of the total area of the site. Non-native grasses and forbs found with the non-native grasslands of the site are common in these areas.

Wildlife species which occupy the adjacent habitats are likely to occur incidentally in this habitat.

**Special Status Plants and Animals**

Several species of plants and animals in California have low populations, limited distributions, or both. Such species may be considered “rare” and are vulnerable to extirpation as the state’s human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Relevant Statutes, Regulations, and Policies (below), State and Federal laws provide the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as threatened or endangered under State and federal endangered species legislation. Others have been designated as “candidates” for such listing. Still others have been designated as “species of special concern” by the CDFG. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered. Collectively, these plants and animals are referred to as “special status species”.

A number of special status plants and animals occur in the vicinity of the site. Exhibits 5.6-3 and 5.6-4 list these species and their potential to occur on the project site.

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16 Inventory of Rare and Endangered Vascular Plants of California, op. cit.
**Exhibit 5.6-3**
**Special-Status Animals Considered to Potentially Occur in Site Vicinity**

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Occurrence in the Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Bruno Elfin Butterfly (Incisalia mossii bayensis)</td>
<td>FE</td>
<td>Grasslands of San Bruno Mountain. Host plant for the butterfly is Sedum spathulifolium</td>
<td><strong>Absent.</strong> Outside the known range of the species. The host plant required for survival of this butterfly was not observed during the site surveys.</td>
</tr>
<tr>
<td>Mission Blue Butterfly (Icaricia icarioides missionensis)</td>
<td>FE</td>
<td>Grasslands of San Bruno Mountain and the Marin Headlands. Host plants are Lupinus albifrons, L. formosus, and L. varicolor.</td>
<td><strong>Absent.</strong> This species is only known from the Marin Headlands in Marin County. No individuals of this species have ever been detected on or adjacent to the site.</td>
</tr>
<tr>
<td>Callippe Silverspot Butterfly (Speyeria callippe callippe)</td>
<td>FE</td>
<td>Grasslands of San Bruno Mountain and Alameda County. Host plant is Viola pedunculata.</td>
<td><strong>Absent.</strong> The site is outside the known range for the species. In addition, the host plant required for survival of this butterfly was not observed during the site surveys.</td>
</tr>
<tr>
<td>Bay Checkerspot Butterfly (Euphydryas editha bayensis)</td>
<td>FT</td>
<td>Native grasslands on serpentine soils. Host plant is Plantago erecta.</td>
<td><strong>Absent.</strong> Outside the known range of the species. While the larval host plant occurs on site, it does not occur at densities typical for the species. Closest known population is Edgewood Park in San Mateo County</td>
</tr>
<tr>
<td>California Tiger Salamander (Ambystoma californiense)</td>
<td>FT, CSC</td>
<td>Vernal pools and stock ponds of central California.</td>
<td><strong>Absent.</strong> No suitable breeding habitat as the site lacks stock ponds or seasonal pools. Not known to breed in region, thus not expected to estivate on site.</td>
</tr>
<tr>
<td>San Francisco Garter Snake (Thamnophis sirtalis tetrataenia)</td>
<td>FE, CT</td>
<td>Ponds, reservoirs and creeks of San Mateo County.</td>
<td><strong>Absent.</strong> Outside the known range for the species.</td>
</tr>
<tr>
<td>California Red-legged Frog (Rana aurora draytonii)</td>
<td>FT, CSC</td>
<td>Rivers, creeks and stock ponds of the Bay Area, preferring pools with overhanging vegetation.</td>
<td><strong>Likely.</strong> Breeds in Keil Pond just off-site. None have been detected on site, but may use the seasonal drainage channels and dense oak woodland for refuge during certain times of the year.</td>
</tr>
<tr>
<td>Bald Eagle (Haliaeetus leucocephalus)</td>
<td>CE</td>
<td>Breeds near lakes, streams, or other bodies of water. Usually forages over these bodies of water.</td>
<td><strong>Unlikely.</strong> Use of project site is expected to be incidental at best.</td>
</tr>
<tr>
<td>Peregrine Falcon (Falco peregrinus)</td>
<td>CE</td>
<td>Individuals breed on cliffs in the Sierra or in coastal habitats; occurs in many habitats of the state during migration and winter.</td>
<td><strong>Possible.</strong> The site provides potential foraging habitat for transients and migrating birds. Not expected to breed on site.</td>
</tr>
<tr>
<td>Willow Flycatcher (Empidonax traillii)</td>
<td>FE (extimus) FT (brewsteri)</td>
<td>Breeds locally in central valley and mountains.</td>
<td><strong>Unlikely.</strong> Uncommon migrant; those birds that may occur on site are probably not of the listed races.</td>
</tr>
</tbody>
</table>

**State Species of Special Concern**

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Occurrence in the Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Pond Turtle (Clemmys marmorata)</td>
<td>CSC</td>
<td>Open slow-moving water of rivers and creeks of central California with rocks and logs for basking.</td>
<td><strong>Unlikely.</strong> This species has never been detected on site and is not expected to occur within the seasonal drainages or freshwater wetland.</td>
</tr>
<tr>
<td>Northern Harrier (Circus cyaneus)</td>
<td>CSC</td>
<td>Frequents meadows, grasslands, open rangelands, freshwater emergent</td>
<td><strong>Likely.</strong> The site provides potential foraging and breeding habitat.</td>
</tr>
<tr>
<td>Species</td>
<td>Status</td>
<td>Habitat</td>
<td>Occurrence in the Study Area a</td>
</tr>
<tr>
<td>---------------------------------</td>
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<td>--------------------------------</td>
</tr>
<tr>
<td>Short-eared Owl (Asio flammeus)</td>
<td>CSC</td>
<td>Open areas with few trees, especially swamplands, lowland meadows and grasslands, irrigated alfalfa fields; tule patches or tall grass for nesting and daytime seclusion.</td>
<td>Possible. Species may forage on the site; however, suitable nesting habitat is absent on the project site.</td>
</tr>
<tr>
<td>Long-eared Owl (Asio otus)</td>
<td>CSC</td>
<td>Forages in open woodlands, riparian habitats, and juniper thickets. Requires thickly wooded areas for nesting and roosting.</td>
<td>Possible. Foraging habitat is present within the grassland, coyote brush scrub habitats of the site. Nesting habitat is present within the coast live oak woodland of the site.</td>
</tr>
<tr>
<td>Burrowing Owl (Athene cunicularia)</td>
<td>CSC</td>
<td>Found in open, dry grasslands, deserts and ruderal areas. Requires suitable burrows. This species is often associated with California ground squirrels.</td>
<td>Absent. While suitable grassland habitat with ground squirrel burrows is present, this species is not known to occur along the Tiburon Peninsula.</td>
</tr>
<tr>
<td>Vaux’s Swift (Chaetura vauxi)</td>
<td>CSC</td>
<td>Migrants and transients move through the foothills of the western Sierra in spring and late summer. Some individuals breed in region.</td>
<td>Unlikely. Migrants and transients may forage on the site during migration, however, breeding habitat is absent.</td>
</tr>
<tr>
<td>Black Swift (Cypseloides niger)</td>
<td>CSC</td>
<td>Migrants and transients found throughout many habitats of state; in Sierra nests are usually associated with waterfalls.</td>
<td>Unlikely. Migrants and transients may forage on the site during migration. Breeding habitat is absent.</td>
</tr>
<tr>
<td>Loggerhead Shrike (Lanius ludovicianus)</td>
<td>CSC</td>
<td>Nests in tall shrubs and dense trees, forages in grasslands, marshes, and ruderal habitats.</td>
<td>Likely. Suitable foraging and breeding habitat occurs on site.</td>
</tr>
<tr>
<td>Yellow Warbler (Dendroica petechia brewster)</td>
<td>CSC</td>
<td>Migrants move through many habitats of Sierra and its foothills. This species breeds in riparian thickets of alder, willow and cottonwoods.</td>
<td>Possible. Migrants may pass through the site during the spring and fall.</td>
</tr>
<tr>
<td>Pallid Bat (Antrozous pallidus)</td>
<td>CSC</td>
<td>Grasslands, chaparral, woodlands, and; most common in dry rocky open areas providing roosting opportunities.</td>
<td>Possible. The site does not provide suitable roosting habitat, but species may forage over the site.</td>
</tr>
<tr>
<td>Townsend Big-eared Bat (Plecotus townsendii townsendii)</td>
<td>CSC</td>
<td>Primarily a cave-dwelling bat that may also roost in buildings. Occurs in a variety of habitats of the state.</td>
<td>Possible. The site does not provide suitable roosting habitat, but species may forage over the site.</td>
</tr>
<tr>
<td>California Mastiff Bat (Eumops perotis californicus)</td>
<td>CSC</td>
<td>Forages over many habitats, requires tall cliffs or buildings for roosting.</td>
<td>Possible. The site does not provide suitable roosting habitat, but species may forage over the site.</td>
</tr>
<tr>
<td>San Francisco Dusky-footed Woodrat (Neotoma fuscipes annectens)</td>
<td>CSC</td>
<td>Found in hardwood forests, oak riparian and shrub habitats.</td>
<td>Possible. The coast live oak woodland and coyote brush scrub habitats provide some suitable habitat.</td>
</tr>
</tbody>
</table>

a Present: Species observed on the site at time of field surveys or during recent past.
Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the site, but it could occur there from time to time.
Unlikely: Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient
Absent: Species not observed on the site, and precluded from occurring there because habitat requirements not met.

Status Designations

<table>
<thead>
<tr>
<th>Species List as Threatened or Endangered Under the State and / or Federal Endangered Species Act</th>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Occurrence in the Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mount Tamalpais Manzanita (Arctostaphylos hookeri ssp. montana)</td>
<td>FE, CE, CNPS 1B</td>
<td>Occurs in chaparral, coastal prairie and coastal scrub habitats in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species is not known from the area and was not observed during plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Presidio Manzanita (Arctostaphylos hookeri ssp. ravennii)</td>
<td>FE, CE, CNPS 1B</td>
<td>Occurs in chaparral, coastal prairie and coastal scrub habitats in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species is not known from the area and was not observed during plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>San Bruno Mountain Manzanita (Arctostaphylos imbricata)</td>
<td>CE, CNPS 1B</td>
<td>Occurs in chaparral habitats on San Bruno Mountain.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species is not known to occur in Marin County and was not observed during plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Small Groundcone (Boschniakia hookeri)</td>
<td>CE, CNPS 2</td>
<td>Occurs in North Coast coniferous forest.</td>
<td>Absent. Suitable habitat is absent.</td>
<td></td>
</tr>
<tr>
<td>Tiburon Mariposa Lily (Calochortus tiburonensis)</td>
<td>FT, CT, CNPS 1B</td>
<td>Occurs in valley and foothill grasslands in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during rare plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Tiburon Indian Paintbrush (Castilleja affinis ssp. neglecta)</td>
<td>FE, CT, CNPS 1B</td>
<td>Occurs in valley and foothill grasslands often in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. However, species occurs within 100 feet west of the site on Old St. Hilary’s Open Space Preserve.</td>
<td></td>
</tr>
<tr>
<td>White-rayed Pentachaeta (Pentachaeta bellidiflora)</td>
<td>FE, CE, CNPS 1B</td>
<td>Occurs in valley and foothill grasslands often in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during rare plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Marin Dwarf Flax (Hesperolinon congestum)</td>
<td>FT, CT, CNPS 1B</td>
<td>Occurs in valley and foothill grasslands and chaparral often in serpentine soils.</td>
<td>Present. Population mapped within serpentine bunchgrass habitat in the southern portion of the site in 1995, 2000, and 2009. The 2009 distribution is depicted on Exhibit 5.6-2.</td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Status</td>
<td>Habitat</td>
<td>Occurrence in the Study Area</td>
<td></td>
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<td>---------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Tiburon Jewelflower (<em>Streptanthus niger</em>)</td>
<td>FE, CE</td>
<td>Occurs in valley and foothill grasslands often in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. However, species occurs within 100 feet west of the site on Old St. Hilary’s Open Space Preserve.</td>
<td></td>
</tr>
<tr>
<td>Showy Indian Clover (<em>Trifolium amoenum</em>)</td>
<td>FE</td>
<td>Occurs in valley and foothill grasslands often in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during rare plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Robust Spineflower (<em>Chorizanthe robusta ssp. robusta</em>)</td>
<td>FE, CNPS 1B</td>
<td>Occurs in coastal bluff scrub, coastal dunes, coastal prairies, and coastal scrub.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during rare plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Presidio Clarkia (<em>Clarkia franciscana</em>)</td>
<td>FE, CE</td>
<td>Occurs in serpentine outcrops of coastal scrub and valley and foothill grassland.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during rare plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>San Francisco Popcorn-flower (<em>Plagiobothrys diffusus</em>)</td>
<td>CE, CNPS 1B</td>
<td>Occurs in coastal prairie, and valley and foothill grassland.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during rare plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Montara Manzanita (<em>Arctostaphylos montaraensis</em>)</td>
<td>CNPS 1B</td>
<td>Occurs on slopes and ridges in chaparral, and coastal scrub.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species is not known from the area and was not observed during plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Marin Manzanita (<em>Arctostaphylos virgata</em>)</td>
<td>CNPS 1B</td>
<td>Occurs in broadleaved upland forest, closed-cone coniferous forest, chaparral, and north coast coniferous forest.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during rare plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Adobe Sanicle (<em>Sanicula maritima</em>)</td>
<td>CR</td>
<td>Occurs in clay or ultramafic soils in meadows and seeps, valley and foothill grassland, chaparral and coastal prairie habitats.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during rare plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Mason’s Lilaeopsis (<em>Lilaeopsis masonii</em>)</td>
<td>CR</td>
<td>Tidal zones of freshwater and brackish marshes.</td>
<td>Absent. Suitable habitat is absent.</td>
<td></td>
</tr>
<tr>
<td>Alkali Milk-Vetch (<em>Astragalus tener var. tener</em>)</td>
<td>CNPS 1B</td>
<td>Occurs in alkali playas, valley and foothill grassland, and vernal pool habitats.</td>
<td>Absent. Suitable habitat is absent.</td>
<td></td>
</tr>
<tr>
<td>Baker’s Navarretia (<em>Navarretia leucocephala ssp. bakeri</em>)</td>
<td>CNPS 1B</td>
<td>Occurs in vernal pools and swales in cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland and lower montane coniferous forest.</td>
<td>Absent. Suitable habitat is absent.</td>
<td></td>
</tr>
<tr>
<td>Bent-flowered Fiddleneck (<em>Amsinckia lunaris</em>)</td>
<td>CNPS 1B</td>
<td>Open oak woodlands and grasslands.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
<tr>
<td>Diablo Helianthella (<em>Helianthella castanea</em>)</td>
<td>CNPS 1B</td>
<td>Open oak woodlands and hillside grasslands of the San</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009.</td>
<td></td>
</tr>
</tbody>
</table>
### Species Status Habitat Occurrence in the Study Area a

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Occurrence in the Study Area</th>
</tr>
</thead>
</table>
| **Fragrant Fritillary**  
( *Fritillaria liliacea* ) | CNPS 1B | Occurs in coastal prairie, coastal scrub, and valley and foothill grasslands often in serpentine soils. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **Kellogg’s Horkelia**  
( *Horkelia cuneata ssp. sericea* ) | CNPS 1B | Occurs in closed-cone coniferous forest, coastal scrub and chaparral in old dunes, coastal sandhills and openings. | **Absent**. Suitable habitat is absent. |
| **San Francisco Bay Spineflower**  
( *Chorizanthe cuspidata ssp. cuspidata* ) | CNPS 1B | Occurs in coastal bluff scrub, coastal dunes, coastal prairies, and coastal scrub. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **San Francisco Gumplant**  
( *Grindelia hirsutula var. maritima* ) | CNPS 1B | Occurs in Great Basin scrub, coastal scrub, and valley and foothill grassland habitats in sandy serpentine soils. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **Mount Tamalpais Thistle**  
( *Cirsium hydrophilum ssp. vaseyi* ) | CNPS 1B | Occurs in serpentine seeps in broadleaved upland forest and chaparral. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **Fragrant Fritillary**  
( *Fritillaria liliacea* ) | CNPS 1B | Occurs in coastal prairie, coastal scrub, and valley and foothill grasslands often in serpentine soils. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **Santa Cruz Microseris**  
( *Stebbinoseris decipiens* ) | CNPS 1B | Occurs in broad-leaved upland forest, closed-cone conifer forest, chaparral, coastal prairie and coastal scrub habitats. It is sometimes associated with serpentine. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **Tamalpais Lessingia**  
( *Lessingia micradenia ssp. micradenia* ) | CNPS 1B | Occurs in chaparral, valley and foothill grassland. Often associated with serpentine soils. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **Marin Checkerbloom**  
( *Sidalcea hickmanii ssp. viridis* ) | CNPS 1B | Occurs in chaparral. Often associated with serpentine soils. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **San Francisco Campion**  
( *Silene verecunda ssp. verecunda* ) | CNPS 1B | Occurs in coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland habitats. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **Tamalpais Jewel-flower**  
( *Streptanthus batrachopus* ) | CNPS 1B | Occurs in talus serpentine outcrops of closed-cone coniferous forest and chaparral. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **San Francisco Owl’s-clover**  
( *Triphysaria floribunda* ) | CNPS 1B | Occurs in coastal prairie and valley and foothill grassland habitats in serpentine soils. | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
| **Western Leatherwood**  
( *Dirca occidentalis* ) | CNPS 1B | Occurs in broadleaved upland forest, closed cone conifer forest, North Coast conifer | **Absent**. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. |
<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Occurrence in the Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marin Checker Fritillary</td>
<td>CNPS 1B</td>
<td>Occurs in coastal prairie, coastal scrub, and valley and foothill grasslands and is often associated with serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. Nearest known location is near Mount Tamalpais, Marin County.</td>
</tr>
<tr>
<td>(Fritillaria affinis ssp. tristulis)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thin-lobed Horkelia</td>
<td>CNPS 1B</td>
<td>Occurs in sandy soils of coastal scrub and chaparral habitats.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009. Nearest occurrence is from Mount Tamalpais.</td>
</tr>
<tr>
<td>(Horkelia tenuiloba)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marin County Navarretia</td>
<td>CNPS 1B</td>
<td>Occurs in closed-cone coniferous forest and chaparral. Often associated with serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009.</td>
</tr>
<tr>
<td>(Navarreria rosulata)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point Reyes Checkerbloom</td>
<td>CNPS 1B</td>
<td>Occurs in freshwater marshes and swamps near the coast.</td>
<td>Absent. Suitable habitat is absent.</td>
</tr>
<tr>
<td>(Sidalcea calycosa ssp. rhizomata)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tiburon Buckwheat</td>
<td>CNPS 3</td>
<td>Occurs in chaparral, coastal prairie, and valley and foothill grasslands often in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009.</td>
</tr>
<tr>
<td>(Eriogonum luteolum var. caninum)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gairdner’s Yampah</td>
<td>CNPS 4</td>
<td>Occurs in chaparral and lower conifer forests often in serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009.</td>
</tr>
<tr>
<td>(Perideridia gairdneri ssp. gairdneri)</td>
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<tr>
<td>Large-flowered Linanthus</td>
<td>CNPS 4</td>
<td>Occurs in open oak woodlands and hillside grasslands with sandy soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009.</td>
</tr>
<tr>
<td>(Linanthus grandiflorus)</td>
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<tr>
<td>Lobb’s Aquatic Buttercup</td>
<td>CNPS 4</td>
<td>Aquatic or terrestrial plant of shallow water, vernal pools, and oak woodland.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009.</td>
</tr>
<tr>
<td>(Ranunculus lobbii)</td>
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<tr>
<td>Marsh Gumplant</td>
<td>CNPS 4</td>
<td>Coastal salt marshes of the San Francisco Bay.</td>
<td>Absent. Suitable habitat is absent.</td>
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<tr>
<td>(Grindelia stricta var. angustifolia)</td>
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<tr>
<td>San Francisco Wallflower</td>
<td>CNPS 4</td>
<td>Coastal scrub, coastal dunes and foothill grasslands on serpentine soils.</td>
<td>Absent. Potentially suitable habitat exists on site, but the species was not observed during plant surveys in 1995, 2000 or 2009.</td>
</tr>
<tr>
<td>(Erysimum franciscanum)</td>
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<tr>
<td>Serpentine Reed Grass</td>
<td>CNPS 4</td>
<td>Occurs in chaparral, meadows, and valley and foothill grasslands often in serpentine soils.</td>
<td>Present. Several patches of this species were mapped in 2009 within the serpentine bunchgrass habitat in the southern portion of the site. The 2009 distribution is depicted on Exhibit 5.6-2.</td>
</tr>
<tr>
<td>(Calamagrostis ophitidis)</td>
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</table>

**Legend:**
- Present: Species observed on the site at time of field surveys or during recent past.
- Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis
- Possible: Species not observed on the site, but it could occur there from time to time.
- Unlikely: Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient
- Absent: Species not observed on the site, and precluded from occurring there because habitat requirements not met.
5.6 Biological Resources

2008 Easton Point Residential Development Draft EIR

Status Designations

<table>
<thead>
<tr>
<th>Code</th>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE</td>
<td>Federally Endangered</td>
<td></td>
</tr>
<tr>
<td>FT</td>
<td>Federally Threatened</td>
<td></td>
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<tr>
<td>FPE</td>
<td>Federally Endangered (Proposed)</td>
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<td>FC</td>
<td>Federal Candidate</td>
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<td>CE</td>
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<td>CT</td>
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<tr>
<td>CR</td>
<td>California Rare</td>
<td></td>
</tr>
<tr>
<td>CSC</td>
<td>California Species of Special Concern</td>
<td></td>
</tr>
<tr>
<td>CNPS</td>
<td>California Native Plant Society Listing</td>
<td></td>
</tr>
</tbody>
</table>

Sources: CNNDB 2009 and USFWS 2009

**Special Status Plant Species which Occur On-Site and Within the Site’s Immediate Vicinity**

Two special status plant species have been confirmed to be present within the serpentine bunchgrass habitat of the site: the Marin dwarf flax and serpentine reed grass. Additionally, three other special status plant species occur within 100 feet of the western boundary of the site on the Old St. Hilary’s Open Space Preserve: the Tiburon Indian paintbrush, Tiburon jewel-flower, and Carlotta Hall’s lace fern (*Aspidotis carlotta-halliae*). The two special status plant species occurring on-site are discussed more fully below.

**Marin dwarf flax (Hesperolinon congestum)**

Federal listing status: Threatened, State listing status: Threatened, CNPS List 1B. Marin dwarf flax is an annual plant species of the family Linaceae that is found in serpentine chaparral or serpentine grassland habitats from Marin County south to San Mateo County. The blooming period ranges from May to July, and its population size can vary widely from year to year at the same location as a result of climate differences. Although not much is known about the reproductive ecology of this species, it is known to be pollinated by native insects such as bee flies and pollen beetles. According to the USFWS’s *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, there are only 21 extant populations of which 11 occur in Marin County. On the Tiburon Peninsula, one population occurs on the Ring Mountain Preserve where it is protected and managed by the Marin County Open Space District (MCOSD). Another population occurs on private lands of the Middle Ridge area of Ring Mountain. The population that occurs on-site is part of a larger population that continues west of the site onto the Old St. Hilary’s Open Space Preserve which is also protected and managed by the MCOSD. The *Recovery Plan* indicates that threats to the species’ survival include residential and recreational development, foot traffic, and competition with non-native species. Approximately 100 individual Marin dwarf flax plants were detected in the southwest corner of the project site during rare plant surveys conducted for the Town of Tiburon by EIR biologists in 1995. These findings were consistent with previous site surveys conducted for the applicant. Surveys that the EIR biologists conducted in the spring and summer of 2000 detected that the population had expanded from that documented in 1995. The population mapped in 2000 occupied approximately 1.17 acres within the northwest area of the serpentine bunchgrass habitat. In June 2007, and in April, May and June 2009, EIR biologists conducted surveys for the species and mapped its current distribution as shown in

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18 Live Oak Associates biologists pin-flagged the margins to map the 2000 distribution of the dwarf flax precisely, after which the applicant’s civil engineer (CSW / Stuber-Stroeh) surveyed the margins using global positioning (GPS) technology. Live Oak Associates biologists then checked the resulting map to ensure its accuracy. This map is part of the project file at the Town of Tiburon Community Development Department but is not available for public review due to the sensitivity of this resource.
Unfortunately, the June 2007 survey was not accurately timed to map that year’s dwarf flax distribution as, except for some late blooming annuals, annual plants in the serpentine areas had already bloomed and senesced, therefore, the EIR biologist was unable to determine the size of the dwarf flax distribution in 2007. However, the population in 2009 had expanded significantly outside of the footprint that was mapped in 2000, now encompassing 2.25 acres, with an estimated population of greater than 3,500 individuals. It should be noted that different patches of dwarf flax were found to be blooming at different times during the season. For instance, surveys conducted early in the season found patches blooming higher up on the slope, while later in the season, additional patches were found blooming lower on the slope. It is not unusual for an annual plant to bloom at different times in areas with slightly different slope, aspect or hydrologic regime. Therefore, any future efforts to map the distribution of the species on this site should include field surveys done throughout the blooming season, from April through June.

**Serpentine reed grass (Calamagrostis ophitidis)** Federal listing status: None, State listing status: None, CNPS List 4  Serpentine reed grass is a perennial bunchgrass that is endemic to serpentine soils in Lake, Marin, Napa and Sonoma counties. Its blooming period is from April to June. It can occur on serpentine soils in a wide variety of habitats including chaparral, coniferous forest, meadows and seeps, and grasslands. The species was first observed on the project site by the applicant’s biologist within the western half of the serpentine bunchgrass habitat during surveys for the [2001 Draft EIR](#). In 2009, the EIR biologists mapped several discrete patches of the species on the site throughout the serpentine bunchgrass habitat. The locations of serpentine reed grass populations also are depicted on [Exhibit 5.6-2](#). The total area of these populations encompasses 0.11 acres, with an estimated population of 142 individuals.

**Animal Special Status Species Which Occur On-Site** While several special status animal species may occur rarely or occasionally on site, the project is only likely to significantly affect the California red-legged frog, which is known to breed near the site in Keil Pond and is presumed to disperse through and forage regularly on the site (though none has been observed directly on-site).

**California red-legged frog (Rana aurora draytonii)** Federal listing status: Threatened, State listing status: Species of Special Concern. The California red-legged frog (CRLF) was petitioned for listing as an endangered species under the authority of the Federal Endangered Species Act based on a significant range reduction and continued threats to surviving populations. The USFWS subsequently listed the frog as threatened in May 1996.

The CRLF is the largest native frog in California. Adults obtain a length of 3.4 to 5.4 inches (85-138

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19 The 2009 distribution of dwarf flax was pin flagged by Live Oak Associates biologists Pamela Peterson and Neal Kramer, who subsequently mapped the distribution utilizing a Trimble Navigation GPS and high-resolution aerial photography.

20 The 2009 distribution of serpentine reed grass was pin flagged by Live Oak Associates biologists Pamela Peterson and Neal Kramer, who subsequently mapped the distribution utilizing a Trimble Navigation GPS and high-resolution aerial photography.


millimeters) from the tip of the snout to the rear of the vent. Dorsally, the background color appears brown, gray, or reddish-brown, normally with a pattern of dark flecks and spots. The distribution of red or red-orange pigment is highly variable but usually is restricted to the belly and the undersurfaces of the thighs, legs, and feet. Two prominent folds of skin (dorsolateral folds) run from the rear of the eyes to the groin. The groin has a distinct black mottling on a white or yellow background.

Juvenile frogs are 1.5 to 3.4 inches (40-84 millimeters) from the tip of the snout to the rear of the vent and have the same coloration as adults except that the dorsolateral folds normally are yellow or orange colored, especially in very young individuals.

Larval frogs range from 0.6 to 3.1 inches (14-80 millimeters) in length. Young tadpoles generally are blackish in color and gradually change to a brown background color with darker marbling or spots.

Adult CRLF s have been observed to breed from late November through early May after the onset of warm rains, although during the 1990s in Santa Clara County they were found to breed from late January through March. Small mobile groups of three to seven individual male frogs often vocalize to attract females. Females move toward the calling groups and ampexus a male. Following ampexus, the females move to oviposition sites where they attach an egg mass of 2,000 to 6,000 moderate-sized (2.0- to 2.8-millimeter diameter) eggs to an emergent vegetation brace (such as tule stalks, grasses, or willow roots) just below the water surface. The egg mass is about the size of a softball after it swells with water for 24 hours. After reproduction, males usually remain at the breeding sites for several weeks before removing to foraging habitats while females immediately remove to these foraging habitats.

CRLF embryos hatch in about six to 14 days after fertilization and resulting larvae (8.8-10.3 millimeters in total length) require 3.5 to 7.0 months to attain metamorphosis at a total length of 65 to 85 millimeters. Larvae are thought to graze on algae, but they are rarely observed in the field because they spend most of their time concealed in submergent vegetation or detritus. Most larvae metamorphose into juvenile frogs (25 to 30 millimeters in total length) between July and September,

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24 Amphibian and Reptile Species of Special Concern in California, M.R. Jennings and M.P. Hayes, California Department of Fish and Game, Inland Fisheries Division, 1994.
26 Amphibian and Reptile Species of Special Concern in California, op. cit.
27 Handbook of Frogs and Toads of the United States and Canada, A.H. Wright and A.A. Wright, 1949.
28 A Field Guide to Western Reptiles and Amphibians, op. cit.
29 A Synopsis of the Amphibia of California, T.I. Storer, 1925.
30 Ibid., and Amphibian and Reptile Species of Special Concern in California, op. cit.
31 Mark Jennings PhD (EIR herpetologist), personal observation.
32 Amphibian and Reptile Species of Special Concern in California, op. cit.
34 Mark Jennings, op. cit., unpublished data.
35 Ibid., and A Synopsis of the Amphibia of California, op. cit.
36 Amphibian and Reptile Species of Special Concern in California, op. cit.
although there are scattered observations of over-wintering larvae in perennial ponds (such as at the arboretum at Golden Gate Park in San Francisco). Post-metamorphic frogs feed on a wide variety of invertebrates and grow rapidly. Most males reach sexual maturity in two years, and females reach sexual maturity in three years. However, frogs of both sexes may reach sexual maturity in one year if resources are sufficient. Alternatively, frogs may take three to four years to reach maturity during extended periods of drought. Based on limited field data, CRLFs appear to live about eight to ten years in the wild. Adult frogs apparently eat a wide variety of animal prey including invertebrates, small fishes, frogs, and small mammals. In Marin County, CRLFs probably are active throughout most the year except for the coldest periods of winter when temperatures dip below freezing.

CRLFs have been observed in a number of aquatic and terrestrial habitats throughout their historic range. Larval, juvenile, and adult frogs have been collected from natural lagoons, dune ponds, pools in or next to streams, streams, marshlands, sag ponds, and springs, as well as human-created stockponds, secondary and tertiary sewage treatment ponds, wells, canals, golf course ponds, irrigation ponds, sand and gravel pits (containing water), and large reservoirs. The key to the presence of frogs in these habitats is the presence of perennial (or near perennial) water and the general lack of introduced aquatic predators (such as centrarchid fishes (largemouth bass \textit{(Micropterus salmoides)}), green sunfish \textit{(Lepomis cyanellus)}, and bluegill \textit{(L. macrochirus)}), crayfish \textit{(Pacifastacus leniusculus and Procambarus clarkii)}, and bullfrogs \textit{(Rana catesbeiana)}. As long as standing water at least several inches deep is present and introduced aquatic predators are rare or nonexistent, CRLFs have a chance of being present. If the aquatic habitat favors introduced aquatic predators, CRLFs probably will disappear over time unless a nearby breeding site is available for this frog that excludes the introduced predators. The habitats which contain the largest densities of CRLFs are associated with deep-water pools (27 inches / less than 0.7 meters deep) with stands of overhanging willows \textit{(Salix spp.)} and an intermixed fringe of cattails \textit{(Typha latifolia)}, tules \textit{(Scirpus spp.)}, or sedges \textit{(Carex sp.)}. However, CRLFs also have been observed to inhabit stock ponds, sewage treatment ponds, and artificial (concrete) pools completely devoid of vegetation. Continued survival of frogs in all aquatic habitats seems to be based on the continued presence of ponds, springs, or pools which are disjunct from perennial streams. Such habitats provide the continued basis for

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37 Mark Jennings, \textit{op. cit.}, unpublished data.
39 Mark Jennings, \textit{op. cit.}, unpublished data.
40 \textit{Amphibian and Reptile Species of Special Concern in California}, \textit{op. cit.}
41 Mark Jennings, \textit{op. cit.}, unpublished data.
44 \textit{Ibid.}
45 \textit{A Synopsis of the Amphibia of California}, \textit{op. cit.}, and Mark Jennings, \textit{op. cit.}, unpublished data.
successful reproduction and recruitment year after year into nearby drainages which may lose frog populations due to stochastic events (such as extreme flooding or droughts).

In lagoon systems and brackish water environments, field and laboratory observations indicate that CRLF's cannot reproduce successfully at salinities greater than 4.5 percent, larvae cannot survive in salinities greater than 7.0 percent, and juvenile and adult frogs avoid salinities greater than 9.0 percent. Thus, frogs largely are restricted to freshwater and slightly brackish water habitats.

Besides aquatic habitats, juvenile and adult CRLF's have been observed in areas of riparian vegetation, often within a few yards (meters) of the water's edge. Frogs have been found using small mammal burrows (often in or under vegetation) and willow root wads and hiding under old boards and other debris within the riparian zone. Juvenile frogs often are observed sunning themselves during the day in the warm surface-water layer associated with floating and submerged vegetation. Adult frogs largely are nocturnal and are known to sit on stream banks or on the low hanging limbs of willow trees over pools of water where they can detect small mammal prey. Radio telemetry studies conducted in lagoons and the lower parts of streams along the central coast of California show that adult CRLF's move within the riparian zone from well-vegetated areas to pools of water to hydrate during periods when many of the central coast streams are dry except for isolated pools. During wet periods, especially in the winter and early spring months, CRLF's can move long distances (one mile / 1.6 kilometer) between aquatic habitats, often over areas which are considered unsuitable for frogs (such as roads, open fields, croplands, etc.). Such activities can result in frogs ending up in isolated aquatic habitats well away from the nearest known frog populations.

CRLF's are eaten by a wide variety of natural predators during each of their life stages. Known predators include black-crowned night herons (Nycticorax nycticorax), bitterns (Botaurus lentiginosus), raccoons (Procyon lotor), garter snakes (Thamnophis spp.), bullfrogs, and introduced centrarchid fishes. Humans, especially children, also may take juvenile and adult frogs from time to time, although such activities are thought to be rare for most populations, particularly more rural populations.

Habitat can be suitable for breeding; for foraging; for daily and winter movement habitat (dispersal); and for summer habitat (restricted to perennially wet areas). These types of habitat are not mutually exclusive and overlap. Breeding habitat could be considered the most important biologically because these source populations ensure that the species remains extant. Foraging and daily movement habitat

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47 Mark Jennings, op. cit., personal observation.
48 “Diet and Feeding Behavior of the California Red-Legged Frog, Rana aurora draytonii (Ranidae)”, op. cit.
49 Ibid., and Amphibian and Reptile Species of Special Concern in California, op. cit.
52 “Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Red-Legged Frog”, op. cit.
allows individuals to persist and mature. Winter movement habitat allows individuals to move into areas which are inaccessible during the dry summer months. Summer habitat consists of wet areas or refugia which allow CRLF to survive during extremely dry periods.

A breeding population of CRLF was first observed in Keil Pond, located just off-site and east of the project site, by Dr. Mark Jennings the EIR herpetologist for the 2001 Draft EIR, on March 2, 1997. At that time it was concluded that dispersing frogs could use the several seasonal drainage channels on the site, and it also was possible that frogs may seek refuge at various times of the year in the dense coast live oak woodlands through which these drainage channels tend to flow. Subsequently, in April 1998, the applicant’s biologist, LSA, conducted an assessment on the project site and in the project vicinity to investigate the potential of the project site to serve as a movement corridor for CRLF. LSA concluded that no breeding habitat occurred on-site and the closest potential breeding habitat in the site’s vicinity, with the exception of Keil Pond, was a pond located near the library in downtown Tiburon, approximately one mile southwest of Keil Pond. LSA did not detect any CRLF in the library pond; however they did not conduct a protocol-level survey of the pond. LSA concluded that due to the lack of potential breeding habitat in the site vicinity to which frogs may disperse from Keil Pond and migrate to, the occurrence of CRLF on the project site was likely to be an uncommon event. Mark Jennings also conducted a habitat assessment on the project site for CRLF on October 1, 2000 which included walking the entire site to observe all habitats of the site. He also conducted diurnal surveys on October 1 and 29, 2000 and nocturnal surveys on October 24 and 25, 2000. The surveys were conducted consistent with the 1999 USFWS protocol. Dr. Jennings also reviewed information on CRLF occurrences recorded by the 2000 CNDDB for the USGS San Quentin and adjacent quadrangles, reviewed available background information, and examined USGS topographic maps and available aerial photography for the site and areas within one mile of the site for surrounding land use and potentially suitable CRLF habitat.

While CRLFs have been detected breeding at Keil Pond and a male CRLF was recorded in September 2000 at an ornamental fountain at 2900 Paradise Drive, no CRLFs have been detected on the site in 1997, 1998, or 2000. The previous documentation for CRLFs on the Tiburon Peninsula has been off-site, on the downhill side of Paradise Drive. Therefore, while it is likely that CRLFs occur at times on the site, how frequently they use the site or how important the various habitats of the site are to the frog is not presently known. It is assumed that the drainage channels of the site likely would provide the most important dispersal and foraging habitat for frogs occurring on-site, but that woodland habitat on-site may provide some marginal dispersal and foraging habitat as well.

**Relevant Statutes, Regulations, and Policies**

Relevant statutes, regulations, and policies in regard to the protection of biological resources on the project site include the following:

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55 Aerial photographs with a scale of 1:12000 flown June 1999.

5.6 Biological Resources

Threatened and Endangered Species  State and Federal “endangered species” legislation provides the CDFG and USFWS with a mechanism for conserving and protecting plant and animal species of limited distribution and / or low or declining populations. Species listed under provisions of the State and Federal Endangered Species Acts as threatened or endangered, candidates for listing, and State species of special concern and listed by the California Native Plant Society as endangered are referred to collectively as “species of special status”. Permits may be required from both the CDFG and USFWS if activities associated with a proposed project would result in the “take” of a listed species. California defines “take” as “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill”, 57 and the Federal Endangered Species Act more broadly defines “take” to include “harm”. 58 The CDFG and USFWS also are responsible agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

Migratory Birds  State and Federal laws also protect most birds. The Federal Migratory Bird Treaty Act prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. 59 This act encompasses whole birds, parts of birds, bird nests, and eggs.

Birds of Prey  Birds of prey also are protected in California under provisions of the California State Fish and Game Code 60 which 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 except as otherwise provided by this code or any regulation adopted pursuant thereto”. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance which causes nest abandonment and / or loss of reproductive effort is considered “take” by the CDFG.

Wetlands and Other “Jurisdictional Waters”  Natural drainage channels and wetlands are considered “Waters of the United States” and are referred to as “jurisdictional waters”. The Corps regulates the filling or grading of such waters by authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by “ordinary high water marks” on opposing channel banks. Wetlands are habitats with soils which are intermittently or permanently saturated or inundated. The resulting anaerobic conditions support plant species known as hydrophytes which show a high degree of fidelity to such soils. Wetlands are identified by the presence of hydrophytic vegetation, hydric soils (soils intermittently or permanently saturated by water), and wetland hydrology according to methodologies outlined in the 1987 Corps of Engineers Wetlands Delineation Manual.

As determined by the United States Supreme Court in Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers (the SWANCC decision), channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. However, the U.S Supreme Court decisions Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers (referred together as the Rapanos decision) impose a "significant nexus" test for federal jurisdiction over wetlands. In June 2007, the USACE and Environmental Protection Agency (USEPA) established guidelines for applying the significant nexus

57  Section 86, California State Fish and Game Code, 1992.
58  16 USC (United States Code), Section 1532(19), 50 CFR (Code of Federal Regulations), Section 17.3.
59  16 USC, Section 703, Supplement I, 1989.
60  Section 3503.5, California State Fish and Game Code, op. cit.
standard. This standard includes 1) a case-by-case analysis of the flow characteristics and functions of the tributary or wetland to determine if they significantly affect the chemical, physical, and biological integrity of downstream navigable waters and 2) consideration of hydrologic and ecologic factors. 61

All activities which involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the Corps. Such permits typically are issued on the condition that an applicant agrees to provide mitigation which results in no net loss of wetland functions or values. No permit can be issued until the Regional Water Quality Control Board (RWQCB) issues a certification (or waiver of such certification) that the proposed activity will meet State water quality standards. The RWQCB also is responsible for enforcing National Pollution Discharge Elimination System (NPDES) permits, including the General Construction Activity Storm Water Permit.

The CDFG has jurisdiction over the beds and banks of natural drainages according to provisions of Sections 1601 and 1603 of the California Fish and Game Code. The CDFG regulates activities which would disturb these drainages via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protects the habitat values of the drainage in question.

**California’s Oak Woodlands Conservation Act** California has an adopted Oak Woodlands Conservation Act (Section 21083.4 of the Public Resources Code). The Act requires that counties determine whether a project within their jurisdiction may result in the conversion of oak woodlands that will have a significant effect on the environment, and, if so, that the county require one or more of the following oak woodlands mitigation alternatives to mitigate these effects:

- Conserve oak woodlands through the use of conservation easements.
- Plant an appropriate number of trees, including maintaining plantings and replacing dead or diseased trees. Plantings of trees, however, shall not fulfill more than one-half of the mitigation requirement for the project.
- Contribute funds to the Oak Woodlands Conservation Fund for the purposes of purchasing oak woodlands conservation easements.
- Other mitigation measures developed by the county.

**Marin County Native Tree Preservation and Protection Ordinance** Marin County has an adopted native tree preservation and protection ordinance (Ordinance No. 3342, Chapter 22.27 of the Marin County Code). This ordinance defines “protected trees” and establishes a mechanism by which their removal is regulated. A “protected tree” is defined as any of the following:

- Any individual native tree with a Diameter at Breast Height (DBH) (measured at a height of 4.5 feet above ground) as specified in Attachment 1 of the ordinance (“Trees Native to the County of Marin”) which is located on an unimproved parcel.
- More than five (5) trees of any native species having a DBH as specified in Attachment 1 where the removal of such trees occurs within any 12-month period on an improved parcel.

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Any tree required to be planted or preserved as a condition of approval of a County discretionary permit application where such tree does not meet one or more of the exemption criteria described in Section 22.27.040 (Exemptions).

Section 22.27.040 of the ordinance provides exemptions on the prohibition to remove protected trees. These exemptions include, but are not limited to:

- The general health of the tree is so poor due to disease, damage, or age that efforts to ensure its long-term health and survival are unlikely to be successful.
- The tree is infected by a pathogen or attached by insects that threaten surrounding trees as determined by an arborist report or other qualified professional as defined by the ordinance.

People who wish to remove protected trees on their property must first obtain a permit from the County. As compensation for any validly-permitted removal of a protected tree, the County may require one or more of the following:

- Establishment and maintenance of replacement trees. Such replacement trees should be predominantly native species that are not highly susceptible to Sudden Oak Death Syndrome or other disease.
- For large properties, a management plan which designates areas of the property for preservation of young stands of trees or saplings.
- Removal of invasive exotic species.
- Posting of a bond to cover the cost of an inspection to ensure success of measures described above.

In the event that replacement tree planting on the site is not feasible or appropriate, the payment of money in the amount of $500.00 per tree removed may be required to be deposited into the Tree Replacement Fund managed by the MCOSD for the planting and maintenance of trees and other vegetation.

The ordinance also includes Marin County’s Oak Woodland Management Voluntary Guidelines which provides guidance to private landowners on the management of oak woodlands on their property with regard to the harvesting of oaks, building within oak woodlands, fire protection, and the disposal of unwanted removed vegetation.

Marin Countywide Plan The Countywide Plan’s (CWP) Natural Systems & Agricultural Element sets forth several broader goals and specific policies aimed at the protection and preservation of biological resources. Many of the goals of this element of the CWP are applicable to the resources of the site, including:

- **Goal BIO-1  Enhance Native Habitat and Biodiversity.** Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.
- **Goal BIO-2  Protection of Sensitive Biological Resources.** Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.
5.6 Biological Resources

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- **Goal BIO-3 Wetland Conservation.** Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.

- **Goal BIO-4 Riparian Conservation.** Protect and, where possible, restore the natural structure and function of riparian systems.

**Description of the Proposed Project**

**Project Features** The proposed project includes a number of management approaches and mitigation measures intended by the applicant to reduce the project’s impacts on biotic resources. The application materials assert that the Precise Development Plan (PDP) would protect and enhance 96 acres of the 110-acre site by designating part of each residential lot as private open space (approximately 35 acres); as well as the dedication of the approximately 60-acre Parcel A and approximately one-third acre Parcel B to the MCOSD. It should be noted that at the time the Draft EIR was prepared, no agreement had been reached between the applicant and the MCOSD for MCOSD to accept the dedication of these parcels. The project also proposes a number of Covenants, Conditions and Restrictions (CC&Rs) with regard to the protection and management of biological resources on-site and specific mitigation measures for impacts to biotic resources.

**Trees** The applicant estimates that project implementation would result in the removal of 742 trees (see Exhibit 3.0-6). The PDP proposes to replace lost trees on-site within Parcel A at a replacement:loss ratio of 3:1 for native trees up to six inches DBH; 4:1 for native trees seven to 12 inches DBH; and 5:1 for native trees 12 inches DBH and larger. It should be noted that the definition of tree under the PDP differs from the definition of a “protected” tree under the County’s Tree Preservation and Protection Ordinance. Under the PDP, any native tree regardless of species or DBH that would be removed would be replaced at the proposed ratio, not just those trees that qualify as a “protected” tree under the County ordinance. The PDP proposes that the applicant would be responsible for the replacement of trees that are removed as a result of the construction of the project’s infrastructure but that other replacement trees would be planted incrementally as they are removed by individual property owners in the development of their lots. The applicant further proposes to prepare a Restoration / Preservation Plan for all trees to be removed which would be submitted to the County for approval prior to issuance of a grading permit. The PDP does not indicate where suitable areas exist on Parcel A for this mitigation, nor provide specific information on how this mitigation would be monitored for success. All trees removed would be disposed of consistent with recommendations of SODS researchers at the University of California.

**Wetlands and California Red-legged Frog** The PDP as proposed preserves the majority of wetlands and all drainageways within Parcel A to be dedicated as permanent open space. In most cases, the PDP also incorporates a minimum 100 foot development setback between the edge of wetlands or drainageways and lot building sites and infrastructure development. The drainageway setbacks are proposed to protect important California red-legged frog movement habitat on-site, as well as water quality in downstream wetland habitats that support the frog. Exceptions to the setback include the building site and landslide repairs on Lot 16 which encroach within the 100 foot setback of a wetland occurring within the private use area of that lot; landslide repairs on Lots 17, 18 and 19 that encroach within the 100-foot setback of Drainageway 1; and landslide repairs (subdrains and debris fences) on Parcel A encroaching within the 100 foot setbacks of Drainageways 2 through 5.

**Marin Dwarf Flax** The PDP proposes to protect Marin dwarf flax (based on the distribution of 1995 surveys) within the approximately one-third acre Parcel B, which includes a 25-foot buffer,
situated between Lots 2 and 7. However, surveys for the 2001 Draft EIR conducted by the EIR biologists in 2000 had shown that the population distribution for the species had already expanded well beyond the limits of Parcel B.

**Exotic Species** The applicant proposes to implement measures to reduce the potential escape of invasive exotic landscape plants from lots’ landscaped private use areas by listing in the CC&Rs lists of representative native species to be planted within the private use areas as well as lists of exotic invasive plants that would be prohibited. Additionally, the proposed *Architectural and Landscape Design Guidelines for Easton Point* state that any existing invasive species must be removed by the landowner prior to installation of new landscaping.

**Project Assumptions** For the purposes of this EIR, all habitats within building footprints are expected to be lost as shown in Exhibit 5.6-2. In addition, with the possible exception of woodland habitat, any remaining habitats, including grassland and scrub habitats, within the building site areas and private use areas (the term “private use areas” refers to all areas of individual lots outside of the building sites as shown in Exhibit 5.6-2), may be substantially altered in the future by individual lot owners, including but not limited to, the removal of native vegetation, planting of landscape trees or shrubs, and as a result of landscape irrigation runoff and chemical down drift from upslope landscaping. Therefore, for the purposes of this EIR, these latter habitats outside building sites but within private use areas are expected to be completely lost.

In addition to these impacts, the EIR assumes that sensitive resources such as serpentine bunchgrass habitat (considered a Sensitive Natural Community by CDFG) (Lots 1 through 7 and 18 through 20), Marin dwarf flax populations (Lots 1 through 4, 6, 7, and 19), and serpentine reed grass populations (Lots 1, 2, and 7) proposed to be protected by inclusion in private use areas (i.e. all areas of individual lots outside of the building sites) would be substantially altered or completely lost. This is because the EIR biologists are aware of very few examples where an endangered plant or a sensitive habitat has been adequately protected in this manner. Given the nature of these habitats (low-growing and difficult for many individuals to identify), it would be nearly impossible to ensure that individual residents would not purposefully or inadvertently harm these habitats. Most property owners associations (as the responsible entity) are ill-equipped to ensure that endangered plants or sensitive habitats are properly monitored or managed. Association board members usually are elected by project residents and have a fiduciary responsibility to the residents. As political and/or economic positions change, there is no guarantee or incentive that over the years the concerns of monitoring or managing these areas in perpetuity would continue to have a high priority. For these reasons and because few examples to the contrary exist, this EIR assumes the worst case for analysis purposes -- that implementation of the PDP would seriously compromise the value of serpentine grasslands and the size and distribution of the Marin dwarf flax.

It is not clear to what extent residents would remove trees within the building sites and private use areas of their individual lots. The EIR assumes that all trees within road alignments and building footprints would be lost, as well as within the footprints of landslide repair areas and to comply with Urban-Wildland Interface Restrictions. Application materials estimate that approximately 742 trees would be removed at final project buildout, (see Exhibit 3.0-6) but the final number cannot be known until detailed plans for homes and other structures on all lots have been precisely designed. In addition, an unknown number of residents may propose to remove all or some trees within their private use areas (i.e. within areas of their lots outside of the designated building sites). While Marin County would review such proposals in view of its tree ordinance, it is not known which trees eventually would be removed. It is expected that the County’s tree ordinance and project’s CC&Rs would protect the remaining trees, particularly those in lots’ private use areas. In the absence of examples of CC&Rs and/or Property Owner’s Associations protecting plants within lots’ private
open space areas, numerous examples demonstrate that municipal tree ordinance and CC&Rs can protect tree resources adequately. For example, by inspecting development in other wooded areas of Tiburon, it is reasonable to predict that most if not all trees remaining within lots’ private open space areas would be retained. Therefore, the EIR biologist accepts the applicant’s estimate that approximately 742 trees would be lost.

In addition to these direct effects, the project could result in indirect effects on wildlife by fragmenting the remaining habitat. While the private use areas of individual lots may be managed to retain some natural elements, increased human activities, fences (even if restricted), driveways, and other structures, etc., would somewhat isolate these habitats from adjacent habitats. Therefore, while these private open space areas would retain a modest species richness and diversity, it is expected to decline compared with existing conditions. These types of decreases are well accepted in the conservation biology field because numerous examples exist to support this assumption. Thus, any remaining fragments of undeveloped habitat -- particularly the coast live oak woodlands contained on lots’ private use areas may be isolated from larger areas of contiguous habitat and would be expected to have lower biological values than those prevailing before development.

**Exhibit 5.6-5** summarizes these assumptions. **Exhibit 5.6-2** illustrates proposed residential lots (including building sites and building footprints), roads and landslide repairs in relation to the site’s habitat types. **Impacts and Mitigation Measures** (below) discusses these potential impacts to the biotic resources in detail.

### **Exhibit 5.6-5**

#### Estimated Impacts to Habitats on the Site

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Existing Conditions</th>
<th>Impact Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>acres</td>
<td>percent</td>
</tr>
<tr>
<td>Coast Live Oak Woodland</td>
<td>47.71</td>
<td>43.37</td>
</tr>
<tr>
<td>Non-native Grassland (non-serpentine)</td>
<td>38.70</td>
<td>35.18</td>
</tr>
<tr>
<td>Serpentine Bunchgrass</td>
<td>11.31</td>
<td>10.28</td>
</tr>
<tr>
<td>Marin Dwarf Flax</td>
<td>2.25</td>
<td>n/a</td>
</tr>
<tr>
<td>Serpentine Reed Grass</td>
<td>0.08</td>
<td>n/a</td>
</tr>
<tr>
<td>Non-native Grassland (serpentine)</td>
<td>0.85</td>
<td>0.77</td>
</tr>
<tr>
<td>Northern Coyote Brush Scrub</td>
<td>10.33</td>
<td>9.39</td>
</tr>
<tr>
<td>Seasonal Wetland / Aquatic</td>
<td>0.94</td>
<td>0.85</td>
</tr>
<tr>
<td>Developed</td>
<td>0.16</td>
<td>0.16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>110.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>


62 Habitat and impact calculations were developed by the EIR biologists based on PDP CAD files provided by the applicant. Wetland impact calculations are estimated based on the location of landslide repairs near the wetland area on Lot 16.

63 The 12.82 acres of woodland impacts assumes a worst case scenario that lot owners remove all woodland habitat from their individual lots inclusive of private use areas. Under a best case scenario where lot owners preserve woodland habitat within all areas outside the building footprints and Urban-Wildland Interface areas, this impact would be reduced to 7.9 acres or 16.56 percent.
Biological Resources – Significance Criteria

The biological resources analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review guidelines. Based on the State CEQA Guidelines the project would have a significant biological resources impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any special-status species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- 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.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant biological resources impact if it would:

- Substantially reduce the number or restrict the range of a rare, endangered, or threatened plant or animal.

- Cause a fish or wildlife population to drop to below self-sustaining levels.

- Adversely affect significant riparian lands, wetlands, marshes, and other significant wildlife habitats.
Biological Resources – Impacts and Mitigation Measures

NO OR LESS-THAN-SIGNIFICANT IMPACTS

Based on the findings of the analyses completed as a part of this Draft EIR it has been determined that the proposed 2008 Easton Point Residential Development project would have no or less-than-significant impacts for the following significance criteria.

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan.

No Habitat Conservation Plan, Natural Community Conservation Plan or other approved conservation plan has been adopted for any portion of the project site. No impact would occur.

Additionally, based on the findings of the analyses completed for the Draft EIR, the project would have no or less-than-significant impacts on the following biological resources that were evaluated either due to their perceived potential to result in significant impacts prior to the Draft EIR analysis, or based upon scoping comments received expressing concerns about these potential impacts.

Loss of Habitat for Special Status Animals

No suitable habitat exists for and / or the project site is outside the known distribution of several of the animal species listed in Exhibit 5.6-3, although some of these special status animals may be occasional visitors, migrants, or transients. These latter species include the northern harrier, black swift, Vaux’s swift, yellow warbler, willow flycatcher, Townsend's big-eared bat, California mastiff bat, and pallid bat.

Several special status species may breed on or adjacent to the site. These include the CRLF, loggerhead shrike and San Francisco dusky-footed woodrat. The latter two species are fairly common breeders with stable populations in central California. Because the site would represent a relatively small amount of the available breeding habitat for these latter two species in the region, impacts on these species from the proposed development would be less-than-significant (however, see Impact 5.6-7 Disturbance to Active Bird Nests, below).

Except for the CRLF (see Impact 5.6-2 Impacts to the California Red-Legged Frog below), the project would not affect the breeding success of any of these species, and any reduction of foraging and / or roosting habitat available to them regionally would be considered insignificant.

No mitigation would be required.

Loss of Northern Coyote Brush Scrub and Non-Native Grassland Habitat

The PDP would result in the loss of approximately 6.1 acres (approximately 59 percent) of coyote brush scrub habitat and 16.6 acres (approximately 42 percent) of non-native grassland (serpentine and non-serpentine). This would be the result of infrastructure and house development, landslide repairs, as well as road improvements that would occur along Paradise Drive at the driveway entrance to Lots 21 through 23 and sight line improvements at the Paradise Drive and Forest Glen Court intersection.
The remaining acreages of these habitats would be preserved in perpetuity within Parcel A. The loss of these habitats would reduce the overall carrying capacity of the site for a variety of animal species including red-tailed hawk, white-crowned sparrow, California towhee, western meadowlark, California black-tailed hare, California vole, western harvest mouse, gray fox, and black-tailed deer. Thus, site development would eliminate or displace some terrestrial vertebrates to undeveloped land nearby. Non-native grassland and northern coyote brush scrub are abundant regionally, and the majority of the biological resources associated with these habitats would continue to be abundant after project completion. The loss of coyote brush scrub and non-native grassland from the site would not significantly affect the biological resources of the region.

No mitigation would be required.

**Interference with Movement of Native Wildlife**

The areas of the site proposed for development consist primarily of a mosaic of habitats from open grasslands to dense woodlands. A diverse assemblage of wildlife species uses these habitats. The movements of these various species on and off the site vary depending on the species in question.

Assessing the importance of an area as a “movement corridor” depends on differentiating between animals’ consistent use patterns. Animal movements generally can be divided into three major behavioral categories:

- Movements within a home range or territory.
- Movements during migration.
- Movements during dispersal.

These different types of movement patterns and how they relate to use of the project site by the various wildlife species are described below.

Home range is defined as the area an animal learns thoroughly and habitually patrols during its normal activities of foraging, mating, and caring for young. The term territory refers to an area an animal defends through overt defense or advertisement. The breeding territories of songbirds are a classic example of this behavior. Not all animals exhibit territorial behavior. Areas used on a regular basis but not usually defended typically are referred to as home ranges.

Along with the normal movements associated with a home range or territory, some wildlife species exhibit a number of distinct movement patterns (such as migration and dispersal). Migration generally is defined as a movement from the breeding or natal grounds to a “wintering” area and the subsequent return for the next reproductive effort. Dispersal generally refers to the movement of an animal (usually juveniles) from its natal area to an area of unoccupied habitat or movements by adults related to short-term changes in resource availability.

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availability. Many small mammals (such as California voles and deer mice) are considered good colonizers since a part of their populations frequently disperse from their sites of origin.

No detailed study of animal movements has been conducted for the project site. However, knowledge of the site, its habitats, and the ecology of the species on-site permits sufficient predictions about the types of movements occurring in the region and whether proposed development would constitute a significant impact to animal movements.

The site is within the foraging radius of many avian species (such as raptors). The home range for many of these species exceeds the size of the project site. A number of other avian species forage in relatively small areas which may be encompassed entirely by the site. A foraging territory also may include only a part of the site. These include the plain titmouse, chestnut-backed chickadee, California towhee, rufous-sided towhee, song sparrow, common bushtit, acorn woodpecker, and Nuttal's woodpecker. Dispersing juveniles of these species may traverse the site, immigrate, or emigrate from the site in search of unoccupied habitat.

Songbirds tend to migrate on a rather broad front in the Bay Area. The Tiburon Peninsula, while providing suitable habitat for many migrating songbirds to use temporarily, is not known to support an unusual concentration of neo-tropical migrants compared with other areas on the Bay. Therefore, the project’s effects on various on-site habitats (such as serpentine bunchgrass, non-native grasslands, and coast live oak forest) are expected to result in a less-than-significant impact on neo-tropical migrants.

The site is within the home range of a number of medium to large mammals (such as coyote, bobcat, raccoon, and black-tailed deer). The home ranges of most of these species are larger than the site. Therefore, these species’ movement patterns (their home ranges) would include parts of adjacent lands. Juveniles of these species would traverse the site, immigrate, or emigrate from it.

The site is not known to be a migratory route for any of the terrestrial species either known to occur on the site or in the vicinity. However, it supports vegetative cover which provides habitat for a variety of wildlife species which use the site during their normal movements (home range or territory). Juveniles of these species (and to a lesser extent adults) may disperse over, from, or onto the site.

The black-tailed deer is a non-migratory and relatively common large mammal which uses virtually all of the upland habitats of Marin County. It is expected to be a relatively common animal on-site, but no density estimates are available for the area. Deer numbers in similar habitats in the coastal region generally vary between ten and 25 deer per square mile. The black-tailed deer is one of the more easily and frequently observed large mammals of the region. The primary mortality factors for deer in these urban / wild areas include poaching, free-roaming dogs, and vehicles. Coyotes, gray foxes, and bobcats also may use wooded areas of the site. None of these species exhibits migratory movements in the area.

Habitat fragmentation is one of the greatest threats currently facing wildlife species. Theoretical ecologists have focused a great deal of effort recently on determining the importance of corridors as landscape links between or among larger (fragmented) habitat areas. A number of advantages of corridors have been identified including their role in helping to prevent local extinctions of isolated

populations, their potential to aid in the support of species which require more resources than can be supplied by single preserves, and their potential as habitat. 68

The project would result in approximately 60 acres of designated open space that would be offered for dedication to the MCOSD. The project also proposes preserving another 34.85 acres within the private use areas of the individual lots. No identified “animal corridor” presently exists on the site, thus development is not expected to have a significant impact on corridor-type movements within the region.

Some species may disperse through the site, but most wildlife presently using the site do so as part of their normal movements for foraging, mating, and caring for young. In other words, the site falls within their home range or territory. Individuals of the various amphibian, reptile, and small mammal species which presently occupy the site would be displaced or lost from the development areas. Therefore, project buildout would represent a loss of some habitat for the wildlife species which presently use the site. The loss of these habitats for wildlife generally would be considered a less-than-significant impact. This is because relatively common wildlife species primarily would be affected which would continue to be abundant in the region after the project implementation and because the project would set aside a significant amount of area which would be managed for these grassland species.

Project implementation would fragment some of the site’s woodland habitats. Such fragmentation can lower wildlife values but not automatically. In some cases, lowered values result from the loss of habitat and not interruption of wildlife movements. Most of the wildlife species that presently are using the woodland habitats would likely continue moving between the open space areas on and west of the site. While development would convert some natural habitats to residential use, it would not act as a “substantial” barrier for most if not all wildlife species which presently use these habitats. Therefore, the lowered wildlife value of various on-site habitats would not be considered a substantial change to wildlife habitat nor would the project substantially alter wildlife movement in the region with the exception of impacts to CRLF (see Impact 5.6-2 Impacts to the California Red-Legged Frog). Project impact on the movement of native wildlife would be less-than-significant.

No mitigation would be required.

**Loss of Habitat for Native Wildlife**

The PDP proposes to preserve in perpetuity approximately 60 acres (or approximately 55 percent) of habitat on-site used by native wildlife, including a mosaic of native and non-native grasslands, coyote brush scrub, seasonal wetland and oak woodlands, within Parcel A to be dedicated to the MCOSD. Implementation of the proposed project would result in the loss of the remaining approximately 50 acres of such habitat used by native wildlife. Although the conversion of oak woodland habitat on-site would result in a significant loss of foraging and dispersal habitat for CRLF, mitigations have been proposed that would lessen these impacts to a less-than-significant level. Although the site supports a diverse wildlife community, other animal species which occur on-site are not expected to decline substantially in the region due largely to the many natural habitats which still occur in Marin County. Therefore, project impacts to habitat for native wildlife would be less-than-significant.

No mitigation would be required.

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Indirect Impacts to Native Wildlife by House Cat Predation

The relative impact of feral or domestic house cats on native wildlife populations in the United States is largely unknown due to the paucity of empirical data on the subject. While the ecology of predation has been studied for many decades, there are relatively few generalities about the effects of a predator (native or exotic) on its prey populations. Data which do exist suggest that house cats can and, at times, do have significant adverse affects on native wildlife, particularly rare or endangered species. House cats have been reported to have a significant impact on shorebird and endemic wildlife on some oceanic islands. 69 One study in East Bay Regional Park noted that species diversity was higher in areas devoid of cats. 70 Other studies in Arizona and southern California found that cat presence in natural environments was controlled somewhat by the presence of coyotes, a cat predator. 71

The diet of house cats in the United States varies depending on how urban their environment is. 72 While house cats can be effective predators on birds, they generally are more adapted to prey on small mammals and at times can have a significant effect on their populations. Small mammals generally make up about 70 percent of their diet, birds 20 percent, and other animals (such as reptiles and amphibians) ten percent, respectively. In the southern California study, where urban development occurred adjacent to fragmented natural habitats, the diet of feral house cats consisted of 43 percent small mammals, 27 percent birds, and 30 percent lizards. Cats were found to play a primary role in the population cycles of several rodent species in Tilden Regional Park in Berkeley. 73 While feral cats were not responsible for the decline of these rodent populations, they most certainly prolonged the recovery phase for these species. The feral cat populations also declined during the low part of the rodent population cycle.

While cats evolved as more of a small mammal predator, they are extremely adaptive and prey quite successfully on a number of bird species. Unfortunately, very few studies have been designed to measure the impacts house cats have on the avian or mammalian fauna of an area. In one case, radio collars were placed on house cats in one low density and another high density housing development in Tucson, Arizona to ascertain the potential impacts house cats have on the fauna of adjacent open space areas. 74 It was found that cats in both developments rarely moved into the open space areas and generally hunted within the developments. The diets of these cats consisted mainly of relatively common birds and mammals. It appears that mortality due to coyote predation was nearly 100 percent for house cats which ventured into the open space areas more than a few times. Similar findings for coyotes have been reported for southern California. 75 In other words, the presence of a cat predator, coyotes or bobcats, can minimize the impact cats have on native wildlife in natural areas. Thus, cats in

74 Impacts of Domestic Dogs and Cats on the Wildlife of Saguaro National Monument, op. cit.
75 “Tabby Go Home; House Cat and Coyote Interactions in Southern California Habitat Remnants”, op. cit.
these types of situations spend a disproportionate amount of time preying on native wildlife within the
development itself.

*Cats: A Heavy Toll on Songbirds, a Reversible Catastrophe* argues that house cats nationwide may
account for as many as 4.4 million songbirds killed daily.  

This estimate is based on numerous implicit and explicit assumptions (many of which are not testable) and not on the meager amount of empirical evidence. Therefore, while the point is well taken that cats may have a profound effect on avian populations, the estimates of bird mortality should not be assumed to be correct. Biologically, the absolute numbers of bird mortality are much less important than are species-specific data. The loss of four million starlings by cat predation, for example, would not be considered significant (and likely would be considered desirable by most biologists), but the predation by cats on ten black rails would have a pronounced effect on the black rail population. In other words, it is difficult to use nationwide estimates in any useful way in assessing potential regional or local effects of cats.

Feral and domestic cats currently are present on the project site where they have been observed foraging in scrub habitat. The presence on the Tiburon Peninsula of coyotes (if any) and their distribution would affect the distribution of cats in the region. Cat ownership in urban areas generally is about 30 percent of households. Survey data in southern California found that nearly one-third of the residents of urban developments adjacent to fragmented open space owned cats. In addition, these households owned an average of 1.7 cats.

Therefore, the project could introduce about 22 cats to the site. Because approximately 25 percent of house cats are indoor cats, only 16 or 17 of these cats would spend some or all of their time outdoors. The proportion of cats which would prey regularly on native wildlife in on- and off-site natural areas is not known. However, access by cats to these natural areas would not be equal throughout the site. It is expected that most predation would occur within the developed areas. While predation on native wildlife by house cats is undesirable, it is expected that the majority project cat predation would be concentrated on relatively common small mammal and bird species. In addition, house cats are not expected to contribute significantly to the decline of any wildlife species on the Tiburon Peninsula. This partly is due to the lack of special-status wildlife species at risk to cat predation near the project site and partly to the expectation that most project cat predation would be focused within developed areas of the site. Therefore, while undesirable, additional predation on native wildlife would not exceed the significance criteria discussed above and would be a less-than-significant impact.

No mitigation would be required.

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77 This estimate was derived as follows: 43 units x 0.30 = 10.2 x 1.7 cats / household = 21.9 cats (22, rounded).
Impact 5.6-1  Impacts to Special Status Plants

Development and long-term use on proposed Lots 1 through 4, 6, 7, and 19 would eliminate 1.68 acres (75 percent) of habitat mapped in 2009 for the federally- and state-threatened Marin dwarf flax which occurs on the site and extends onto the Old St. Hilary’s Open Space Preserve. Development and long-term use on proposed Lots 1, 2, 6, and 7 would eliminate 0.06 acres (75 percent) of habitat mapped in 2009 for the serpentine reed grass (CNPS List 4). Landscape irrigation runoff, as well as the downdrift of landscape chemicals (herbicides, fertilizers) and non-serpentine fill and / or topsoils onto Old St. Hilary’s Open Space Preserve from the building site of Lot 1 could result in indirect impacts to three special status plant species occurring within 100 feet of the project boundary, including the federally-endangered and state-threatened Tiburon Indian paintbrush, the federally-endangered and state-endangered Tiburon jewelweed, and the Carlotta Hall's lace fern (CNPS List 4). This would be a significant impact.

According to the USFWS Recovery Plan for Serpentine Species of the San Francisco Bay Area, the population of Marin dwarf flax on the project site represents one of only 11 extant populations of this species in Marin County, of which only five are known on the Tiburon Peninsula. The latter include three populations which are currently fully protected and managed by the MCOSD. The population occurring on the site also extends onto the adjacent Old St. Hilary’s Open Space Preserve where that part of the population is also protected and managed by the MCOSD. Remaining Tiburon Peninsula populations occur on private land in the Middle Ridge that was slated for development at the time the Recovery Plan was developed.

The PDP proposes to preserve the on-site dwarf flax population (as mapped in 1995) within Parcel B (approximately 0.33 acres) to be dedicated to the MCOSD. However, the population as mapped by the EIR biologists in 2009 far exceeds the boundaries of Parcel B, encompassing 2.25 acres on-site. Under the PDP, approximately 0.57 acres of the current distribution of dwarf flax would be preserved in perpetuity within Parcel A and B to be dedicated to the MCOSD, however, approximately 1.68 acres (75 percent of the population) occurs within the building envelopes, building sites, and / or private use areas of Lots 1 through 4, 6, 7, and 19. Although a small amount of the currently documented dwarf flax population on the site is proposed to be protected within Parcel B (estimated at 0.17 acres), this portion of the population would be unlikely to persist because it would be completely surrounded by Lots 2 and 7, isolated from the protected portion of the population occurring on Old St. Hilary’s Open Space Preserve, and no provisions for access for the purposes of monitoring or managing this parcel by the MCOSD is proposed in the PDP. Therefore, unless Lots 4 and 7 were re-configured to connect Parcel B with Old St. Hilary’s Open Space Preserve and to allow access for the purposes of monitoring and managing this parcel, this portion of the population would not be considered to be preserved in perpetuity.

In addition to the dwarf flax, several discrete patches of serpentine reed grass were mapped within the serpentine bunchgrass habitat on the site, totaling 0.08 acres. Two of the patches (0.02 acres) would be preserved within Parcel A, but the remaining patches (0.06 acres) occur within the building envelopes and / or private use areas of Lots 1, 2, 6, and 7 and would be presumed lost either as a result of development or as a result of the long-term use of those parcels.

Portions of the on-site populations of dwarf flax and serpentine reed grass occurring on individual lots outside of the building envelopes are not likely to persist over the long term. The EIR biologists are aware of very few examples that demonstrate that a rare plant species can be protected and managed adequately within private open space (that is, areas deeded to individual lot owners), whether funded and managed by a home owners association or by individual residential lot owners, especially when a population is almost completely surrounded by development. Various human activities (herbicide and
fertilizer use, over-watering, bike riding, trampling, land clearing and other activities) may occur despite deed restrictions, CC&Rs, and lot-owner or Property Owners Association observation and may damage or harm these populations purposefully or inadvertently.

The proposed project would result in a significant unavoidable impact to the Marin dwarf flax and in a significant impact to serpentine reed grass. Unfortunately, due to the unique properties of serpentine soils, the creation of replacement habitat either on-site or off-site on non-serpentine soils for these serpentine endemic plants as a mitigation would not be feasible. While some opportunity might be present to establish additional areas of serpentine reed grass on-site within the remaining protected serpentine bunchgrass habitat of Parcel A, very little area currently exists in this habitat where dwarf flax does not already occur based on the distribution as mapped in 2009, and so the establishment of sufficient new areas of dwarf flax on-site to mitigate project losses is not feasible. Additionally, because of the limited occurrences of dwarf flax in the project region, the purchase and preservation of sufficient off-site lands supporting this species to mitigate on-site impacts also would not be feasible. The only feasible mitigation to reduce impacts to a less-than-significant level would be to redesign the PDP site plan either to greatly reduce both direct and indirect impacts or eliminate impacts altogether.

In addition to the special status plants occurring on-site, the proposed project could also result in significant indirect impacts to special status plants occurring off-site on Old St. Hilary’s Open Space Preserve. In addition to dwarf flax which occurs on Old St. Hilary’s Open Space Preserve immediately adjacent to the project’s western boundary, the EIR biologists, during plant surveys conducted in 2009, confirmed the occurrence of Tiburon Indian paintbrush, Tiburon jewel-flower, and Carlotta Hall’s lace fern within 100 feet of the project’s western boundary, downslope from the building envelope of Lot 2. Excess irrigation run-off and the downdrift of non-serpentine fill and/or top soils, herbicides and fertilizers from landscaped areas of Lot 2 over time could favor the growth of non-native invasive plants within the serpentine bunchgrass habitat on Old St. Hilary’s Open Space Preserve which could diminish this habitat for rare plants. This effect can already be seen on-site along the southern boundary where non-native grasses now dominate the strip of serpentine habitat adjacent to the landscaped areas of homes on Mountain View Drive.

Several other special status plant species are known to occur in the project region but are considered absent from the site due to lack of habitat, or because they were not observed during plant surveys conducted in 1995; May and August 2000; and April, May, and June 2009. These surveys detected no special status species on-site or immediately off-site (within 100 feet of the project boundary), except for those species discussed above. Therefore, the proposed project would have no effect on local populations of any other special status plant species.

**Mitigation Measure 5.6-1** The applicant shall implement the following mitigation measures to avoid or reduce impacts to special status plants:

**Mitigation Measure 5.6-1(a) Avoid impacts to special status plants:**

- Redesign the PDP site plan to preserve on-site populations of Marin dwarf flax and serpentine reed grass within Parcel A or Parcel B at a minimum preservation:loss ratio of 3:1, and to provide minimum setbacks from preserved populations of these species occurring on-site or off-site on Old St. Hilary’s Open Space Preserve to ensure these populations are not indirectly impacted by landscape irrigation run-off, or downdrift of landscape chemicals or non-serpentine fill or top soils. The minimum setback for all lots that occur adjacent to and upslope from off-site or on-site populations (as mapped in 2009) shall be 100 feet from the edge of the off-site population or the edge of populations preserved on-site within Parcel A or B to the closest lot building and landscape envelope. The minimum setback for all other adjacent lots shall be 50 feet from the
edge of the off-site population or the edge of populations preserved on-site within Parcel A or B to the closest lot building and landscape envelope.

**Mitigation Measure 5.6-1(b)** Ensure the in perpetuity preservation of special status plant habitat remaining after project development:

- The applicant shall dedicate preserved populations of Marin dwarf flax and serpentine reed grass on-site (Parcel A and Parcel B) to the MCOSD. However, should no agreement be reached with the MCOSD regarding such a dedication, then the applicant shall dedicate these parcels to public agency or non-profit approved by Marin County, as determined in consultation with all applicable resource agencies (CDFG and USFWS) for control and management.

- As an alternative to fee title dedication of all or any portion of Parcel A or Parcel B and with the approval of Marin County, the POA may retain ownership of these parcels, or any portion of these parcels and dedicate a conservation easement to a public agency or non-profit approved by Marin County, in consultation with all applicable resource agencies (CDFG and USFWS). Any such parcel(s) shall be subject to the same Resource Management Plan as Parcel A and B (see Mitigation Measure 5.6-1(c) below).

**Mitigation Measure 5.6-1(c)** Ensure the in perpetuity preservation and management of special status plant habitat remaining after project development:

- Develop and implement a Resource Management Plan (RMP) for all sensitive habitats (special status plant habitat, CRLF habitat, native bunchgrass habitat, woodland habitat, and wetlands) preserved within Parcels A and B (or any other parcels created for the purpose of habitat preservation as stated in Mitigation Measure 5.6-1(b)). Marin County CDA Planning Division shall review and approve the RMP in consultation with the MCOSD and all applicable agencies (CDFG, USFWS, USACE, etc.). The RMP shall be written by a qualified biologist with expertise in the various sensitive resources to be covered by the RMP. At a minimum, the RMP shall include the following:
  - Allowed and prohibited activities on preserved lands.
  - The locations and types of any fencing, signs and / or displays to be constructed on preserved lands.
  - A monitoring and management plan for non-native and / or invasive species, or pathogens, considered detrimental to protected resources (weed abatement, invasive species removal, SODS management, CRLF predator control, etc.).
  - The types and frequency of any maintenance activities to be conducted on preserved lands (litter removal, fence or sign repairs, etc.).
  - A Fuel Management Plan element to ensure that vegetation on preserved areas and adjacent private lots within the project site would be maintained consistent with all current and future fire safety guidelines. The plan shall include provisions for mitigating woodland impacts as a result of fuel management activities through woodland enhancement in unaffected areas of the site.
  - A mitigation, monitoring and management plan for any sensitive habitats to be restored, enhanced or created on preserved lands (wetlands, CRLF habitat, etc.) as required by the EIR.
mitigation measures or that may be required as a result of permit conditions of regulating agencies. The plan shall include the extent of the monitoring period, quantifiable performance measures and success criteria; an adaptive management component with remedial measures should performance measures fall short of success criteria; quantifiable final success criteria; and a once-annual report of findings to be provided to the County and any applicable resource agencies.

- A monitoring plan to monitor the condition of resources occurring on preserved lands and adjacent private lots within the project site. This monitoring plan would help the responsible public agency or non-profit determine if private landowners are engaging in activities which are prohibited under the CC&Rs, and which are having adverse affects on adjacent preserved resources. A component of the monitoring plan would be to ensure that adjacent private lot owners within the project site are managing vegetation on their lots consistent with any current and future fire safety requirements. The plan would include a provision for a once-annual meeting between the POA and the responsible public agency or non-profit staff to discuss results of these monitoring activities and necessary remedial measures.

- Clearly stated short-term and long-term responsibilities of the applicant, the POA, and the MCOSD or other approved public agency or non-profit for the implementation and funding of the RMP.

- Determine a mechanism by which the Resource Management Plan shall be funded in perpetuity in consultation with Marin County, the MCOSD or other approved public agency or non-profit, and all applicable agencies (CDFG, USFWS, USACE, etc.). Such a mechanism would be the establishment by the applicant of a non-wasting endowment, funded by the applicant and / or through monthly POA fees.

**Significance after Mitigation** Due to the rarity of Marin dwarf flax, all but the smallest impact on this species would constitute a significant (and likely unavoidable) impact. Implementation of Mitigation Measures 5.6-1(a) through 5.6-1(c) would protect in perpetuity 1.75 acres (78 percent) of the existing on-site dwarf flax population (in essence, provide for greater than a 3:1 (preservation:loss)) ratio, as well as protect in perpetuity the majority of on-site populations of serpentine reed grass. Therefore, implementation of all of these measures combined potentially could reduce the project’s impact to Marin dwarf flax to a less-than-significant level, as well as reduce impacts to all other special status plants occurring on-site, or in close proximity to the site, to a less-than-significant level.

Mitigation Measure 5.6-1(a) may require the relocation or elimination of Lots 1 through 3. As discussed above, no other feasible measure (such as the purchase and preservation of off-site habitat or the creation of compensatory habitat on-site or off-site) is available as an alternative to Mitigation Measure 5.6-1(a) which would provide a comparable level of mitigation. If Mitigation Measure 5.6-1(a) is determined to not be feasible, the implementation of Mitigation Measures 5.6-1(b) along with 5.6-1(c) would reduce project impacts on special status plants, but not to a less-than-significant level. Therefore, in the absence of the implementation of Mitigation Measure 5.6-1(a), project impacts on special status plants would be a significant unavoidable impact.

**Responsibility and Monitoring** The applicant would be responsible for redesigning the PDP and submitting it to the County for approval. In addition, the applicant would be responsible to develop and implement the Resource Management Plan, until such time that preserved lands are dedicated to the MCOSD or other approved public agency or non-profit, at which time the latter would take over
implementation of the RMP. The applicant and / or the POA would be responsible for funding the RMP.

**Impact 5.6-2 Impacts to the California Red-Legged Frog**

No suitable breeding habitat for the California red-legged frog exists on-site. However, the proposed project would result in a significant impact to foraging habitat and dispersal movements for frogs which breed in Keil Pond. Should individual frogs occur on-site during project construction, such activities could result in mortality or harm to these individuals. Additionally, the project could result in degradation to downstream waters during project construction and operation and this could potentially result in impacts to the CRLF breeding habitat in Keil Pond. This would be a significant impact.

The California red-legged frog (CRLF) has not been detected on-site but is known to breed in Keil Pond, located downslope to the east of the project site on the other side of Paradise Drive. In September 2000, CRLF were also documented in an ornamental fountain, also located downslope of Paradise Drive from the project site. CRLFs are not expected to breed on the project site due to the lack of suitable breeding habitat. However, some individual CRLFs likely disperse into the heavily wooded habitats of the site or along its seasonal drainageways during certain times of year. Biologists associated with the applicant and the 2001 Draft EIR suggest that proposed lots within the Forest Glen portion of the project (Lots 25 through 34) might disrupt dispersal movements of foraging frogs. 78 While the EIR herpetologist noted that the extent of CRLF occurrence on-site is not presently known, he generally concurred that some proposed lots noted by Sycamore Associates might disrupt movement of frogs in the area. This is because several lots would be located within the woodland habitats along Paradise Drive.

The PDP proposes to preserve in perpetuity approximately 35.1 acres of the oak woodland habitat on the site within Parcel A that is presumed to provide at least marginal foraging and dispersal habitat for CRLF. Parcel A is proposed for dedication to the MCOSD for in perpetuity control and management, although no formal agreement has yet been reached with the MCOSD for this dedication. The PDP further proposes to incorporate a 100-foot buffer between all of the drainageways on the site and proposed building sites. However, potentially, landslide repairs occurring on Lots 17, 18, and 19 would encroach within the buffer area of Drainageway 1. **Exhibit 5.6-2** shows the approximate limits for these repairs, although, as discussed in **Section 5.4 Geology and Soils**, these repairs could exceed the limits which are depicted. Additionally, subdrains and / or debris fences are proposed within the 100-foot buffers of the remaining four drainageways on the site (these are discussed in greater detail in the paragraph below). While landslide repairs would encroach into the buffer of Drainageway 1, this area of the drainageway is not likely to provide habitat for CRLF as it occurs within non-native grassland habitat with very little cover for CRLF. All other drainageways of the site occur primarily within woodland habitats that likely provide more important dispersal and foraging habitat for CRLF. For the most part, with the exception of encroachment into buffer areas for landslide repairs (subdrains, debris fences, etc.) drainageway preservation and buffers as proposed would avoid the majority of impacts to wooded drainageway habitats which are likely to provide the most valuable foraging and dispersal habitat for CRLF on the site, and also would reduce water quality impacts to off-site CRLF breeding habitat in Keil Pond. Landslide repairs, such as the installation of subdrains, would result in temporary impacts within drainageway buffers. Pursuant to requirements for the RMP, temporary impacts would be mitigated by restoring temporarily disturbed habitats. The installation of

drift fences would result in minor permanent impacts, but the RMP would also provide for the enhancement of vegetation on-site to compensate for these minor impacts.

Assuming a worst case scenario, assuming woodland habitat is removed from all lots where it occurs, inclusive of the private use areas (i.e. all areas of the lots outside of the proposed building footprints and building sites as shown in Exhibit 5.6-2), the project would impact 12.82 acres or approximately 27 percent, of the oak woodland habitat on site as a result of project development and conformance with Urban-Wildland Interface Restrictions. Under the best case scenario (assuming all woodland habitat is retained within the private use areas of lots where it occurs and only would be lost within the building sites of Lots 14, 23, and 25 through 34), the impact would be reduced to approximately 7.9 acres, or 17 percent of the woodland habitat on-site. The reality is that the actual impact would likely be somewhere between these two scenarios. Additionally, the proposed landslide repairs would result in some temporary impacts and minor permanent impacts to CRLF foraging and dispersal habitat. These include the establishment of subdrains within Drainageway 2 and below the confluence of the upper two segments of Drainageway 3, as well as permanent debris fences that would be installed at the lower end of Drainageways 2 through 5 as shown in Exhibit 5.6-2. It should be noted that the footprints of landslide repairs shown in the latter exhibit are approximate based on the best current information, but could end up to be larger as discussed in Section 5.4 Geology and Soils.

Despite the in perpetuity preservation of wooded Drainageways 2 through 5 and the in perpetuity preservation of approximately 36 acres of woodland habitat on-site within Parcel A, both of which likely provide foraging and dispersal habitat for CRLF, the proposed project would result in a significant impact to between approximately 7.4 and 12.8 acres of such habitat on-site (between approximately 15 and 27 percent), and also have a potentially significant impact on dispersal movements for CRLF which breed in Keil Pond. The location of Lots 25 through 34, at project buildout, would likely create a barrier between on-site woodlands and drainages occurring to the south of such lots and those on-site and off-site woodlands and on-site drainages occurring to the north. In effect, if the PDP is not redesigned to provide connectivity between these two areas, CRLF habitat preservation credit would be restricted to only those preserved woodlands in the southeastern portion of the site that would continue to have connectivity to breeding habitat at Keil Pond.

Additionally, the EIR hydrologist indicates that project implementation could result in hydrologic impacts that may affect both water quality (see Impact 5.5-1 Water Quality and 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation) and water flow patterns in on-site drainageways that flow downstream to Keil Pond (see Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply). Water quality impacts include erosion and excess sedimentation due to the increase in impervious surfaces on the site, and increased pollutants that could be carried into drainageways of the site, such as chemicals used in on-site landscape maintenance and oil and grease from increased automobile use on the site. Such increased sedimentation and chemical run-off from the site could potentially impact the water quality of Keil Pond and therefore have indirect impacts to breeding habitat for CRLF, although it is difficult to predict or evaluate the extent of such indirect impacts. Also, subdrains placed in Drainageways 2 and 3 would have the effect of de-watering the lower reaches of these drainageways during periods of low-flow. However, while this may have the effect of dewatering drainageways on-site, all drainageway waters diverted into the on-site subdrains would end up back in the drainageway further downstream near Paradise Drive, so overall flows off-site and to Keil Pond would not be affected and no impact to CRLF breeding habitat is expected.

**Mitigation Measure 5.6-2** The applicant shall implement all of the following mitigation measures:

**Mitigation Measure 5.6-2(a)** Avoid impacts to CRLF dispersal movements:
• Redesign the PDP to remove, relocate, reduce or reconfigure lots within the Forest Glen area to provide in perpetuity connectivity via a minimum 100-foot wide woodland corridor between preserved woodland habitat in the southern and northern portions of the site. The corridor area could be contained within the private use area of individual lots outside of any building site areas with a permanent conservation easement established and granted to the MCOSD or other public agency or non-profit; or could be incorporated into Parcel A for dedication to the MCOSD or other public agency or non-profit. Under either option, the corridor shall be monitored and managed pursuant to the RMP.

• If the redesign of the PDP to provide for a 100-foot corridor is not feasible, then the applicant shall create wetland habitat on-site, or enhance the existing wetland near the top of Drainageway 2, such that these wetland habitats function as on-site breeding habitat for CRLF. The project would result in impacts to drainageways that likely would be considered jurisdictional waters of the U.S. and State as the result of the installation of subdrains and debris fences; as well as to wetlands as the result of the installation of a buried pier and grade beam wall on Lot 16 and the de-watering of the spring on Lot 8 (see Impact 5.6-5 Disturbance to Jurisdictional Waters). Creating or enhancing habitat at a minimum of a 2:1 ratio to mitigate impacts to jurisdictional waters simultaneously could contribute towards alleviating impacts on California red-legged frogs via the exchange of lesser quality foraging and dispersal habitat occurring on the northern portion of the site for higher quality breeding habitat.

Mitigation Measure 5.6-2(b) Compensate for a loss of CRLF habitat:

• Preserve CRLF foraging and dispersal habitat on-site at a minimum 3:1 preservation:loss ratio.

• If the on-site preservation of CRLF habitat at a 3:1 (preservation:loss) ratio is not feasible, the applicant shall make up any difference in the ratio by purchasing and preserving CRLF habitat off-site in the project region and establishing a conservation easement on the site. A CRLF Mitigation Plan would need to be developed, implemented and funded for the off-site preserved lands as per the same requirements contained in Mitigation Measure 5.6-1(c). This area should be of sufficient acreage and suitable for the frog and would need to be approved by Marin County and the applicable resource agencies (USFWS, CDFG) as suitable for replacing lost foraging and dispersal habitat.

Mitigation Measure 5.6-2(c) Ensure the in perpetuity preservation of CRLF habitat remaining after project development:

• The applicant shall dedicate all preserved CRLF habitat on-site (Parcel A) to the MCOSD. Should no agreement be reached with the MCOSD regarding such a dedication, the applicant shall dedicate the parcel to another public agency or non-profit approved by Marin County, as determined in consultation with all applicable resource agencies (CDFG and USFWS) for control and management.

• Design, build, and operate the project in order to maintain the water quality in downstream drainage channels and off-site ponds by developing Best Management Practices (BMPs) appropriate for the project (including and consistent with Mitigation Measure 5.5-1 and 5.5-3), which are designed to reduce project impacts to downstream waters to a less-than-significant level.
Mitigation Measure 5.6-2(d) Ensure the in perpetuity preservation and management of CRLF habitat remaining after project development by developing, implementing and funding an RMP as set forth in Mitigation Measure 5.6-1(c).

Mitigation Measure 5.6-2(e) Ensure that individual CRLFs are not harmed or killed during project construction by preceding development within the woodland habitats and occurring within 300 feet of any drainageway by pre-construction surveys conducted within 48 hours of initial disturbance activities. For all activities occurring within the bed or bank of drainageways, daily construction monitoring by a qualified biologist will be required to ensure that CRLFs are not harmed or killed.

Significance after Mitigation Implementation of Mitigation Measures 5.6-2(a) through 5.6-2(e) would result in the in perpetuity preservation and management of a minimum of 35.6 acres of foraging and dispersal habitat for CRLF to compensate for between 7.4 and 12.8 acres of such habitat that would be lost as a result of the project, or an approximate minimum preservation:loss ratio of 3:1 (almost 5:1 under the best case scenario and 2.8:1 given the worst case scenario). Lastly, it would eliminate or reduce the likelihood of individual CRLF being harmed or killed during project construction. As such, when implemented together, these mitigation measures would reduce impacts to CRLF to a less-than-significant level.

Responsibility and Monitoring The applicant would be responsible for redesigning the PDP and submitting it to the County for approval. As necessary, the applicant would also be responsible for locating and purchasing off-site CRLF habitat. In addition, the applicant would be responsible for developing and implementing the RMP for any on-site or off-site preserved or created CRLF habitat. Once either the MCOSD or other approved public agency or non-profit takes over control and management of any preserved lands, they would assume responsibility for implementing the RMP. The applicant and / or the POA would be responsible for funding the RMP. The applicant would be responsible for ensuring that pre-construction surveys for CRLF are written into the CC&Rs. Individual lot owners would be responsible for having pre-construction surveys conducted prior to construction on their individual lots and would be responsible for providing proof of such pre-construction surveys to the County.

Impact 5.6-3 Loss of Serpentine Bunchgrass Project implementation would result in the loss of 9.72 acres of serpentine bunchgrass habitat which is considered to be a Sensitive Natural Community by CDFG. This would eliminate approximately 86 percent of this habitat on-site. Because this habitat is not abundant regionally, this loss would be a significant impact. Additionally, preserved serpentine bunchgrass habitat remaining after project implementation could be impacted by the indirect effects of irrigation run-off and downdrifting of non-serpentine fill soils and landscape chemicals used on lots located upslope from the preserved habitat. This would be a significant impact.

Under the PDP, the applicant proposes to preserve approximately 1.6 acres (approximately 18 percent) of serpentine bunchgrass habitat on the site within Parcel A and B and dedicate these preserved lands to the MCOSD for control and management. Development of residential lots and roads, and long-term uses of private use areas would result in the direct loss of 9.72 acres (approximate 86 percent) of serpentine bunchgrass habitat from the site. The serpentine bunchgrass habitat that would be lost supports the majority of the currently mapped distribution of the Marin dwarf flax and serpentine reed grass. Exhibit 5.6-2 shows that serpentine bunchgrass habitat is present within the building envelopes and / or private use areas of proposed Lots 1 through 7, 18 through 20, and 24. Although the PDP proposes that significant areas of this habitat type would be preserved within the private use areas of these lots, as noted above in the special status plant discussion (Impact 5.6-1 Impacts to Special Status Plants), there is no evidence that sensitive habitats can be protected adequately within the private open
space areas of residential lots. It would be nearly impossible to control the use of these areas through CC&Rs (such as by prohibiting or restricting access to these areas by the people who own them) in ways which reasonably could protect the habitat in perpetuity. Therefore, serpentine bunchgrass habitat occurring in these areas would be presumed to be lost. In addition, the loss of the site’s serpentine bunchgrass habitat would reduce the area’s native botanical diversity. Since this sensitive habitat is not abundant regionally, the direct loss of 9.72 acres of this habitat to development would be significant. Lastly, excess irrigation run-off and the potential downdrift of non-serpentine fill soils and/or topsoils and landscape chemicals (herbicides, fertilizers, etc.) from Lots 6 and 19 could alter the hydrologic, chemical and nutrient regimes of these habitats, thus favoring the growth of non-native annual grasses and forbs in preserved serpentine bunchgrass habitat occurring downslope from these lots (including preserved serpentine bunchgrass habitat immediately off-site on Old St. Hilary’s Open Space Preserve), which in turn could result in indirect impacts to native diversity and special status plants in the preserved areas.

As was indicated in Impact 5.6-1, the creation of serpentine habitat on-site or off-site to compensate for project impacts to serpentine bunchgrass habitat is not feasible. Because this habitat type is not abundant regionally, the purchase and preservation of off-site serpentine bunchgrass habitat to compensate for on-site impacts is also not likely to be feasible.

**Mitigation Measure 5.6-3** The applicant shall implement the following measures to eliminate or reduce impacts on serpentine bunchgrass habitat:

**Mitigation Measure 5.6-3(a)** Avoid direct impacts to serpentine bunchgrass habitat:

- Redesign the PDP to preserve serpentine bunchgrass habitat within Parcels A and/or B at a minimum 3:1 preservation:loss ratio.

**Mitigation Measure 5.6-3(b)** Ensure the in perpetuity preservation of serpentine bunchgrass habitat remaining after project development:

- The applicant shall dedicate all preserved serpentine bunchgrass habitat on-site (Parcel A and B) to the MCOSD. Should no agreement be reached with the MCOSD regarding such a dedication, the applicant shall dedicate the parcel to another public agency or non-profit approved by Marin County, as determined in consultation with all applicable resource agencies (CDFG and USFWS) for control and management.

- As an alternative to fee title dedication of all or any portion of Parcel A or Parcel B and with the approval of Marin County, the POA may retain ownership of these parcels, or any portion of these parcels and dedicate a conservation easement to a public agency or non-profit approved by Marin County, in consultation with all applicable resource agencies (CDFG and USFWS). Any such parcel(s) shall be subject to the same Resource Management Plan as Parcel A and B (see Mitigation Measure 5.6-1(c) below).

**Mitigation Measure 5.6-3(c)** Ensure the in perpetuity preservation and management of serpentine bunchgrass habitat remaining after project development by developing, implementing and funding an RMP as set forth in Mitigation Measure 5.6-1(c).

**Mitigation Measure 5.6-3(d)** Avoid indirect impacts to preserved serpentine bunchgrass habitat:

- Incorporate barriers such as retaining walls along the downslope edges of the building envelopes of Lots 6 and 19 (as well as Lot 2 if not eliminated or relocated) to preclude irrigation and
landscape chemicals from making their way downslope onto on-site and off-site preserved serpentine bunchgrass habitats.

**Significance after Mitigation** Implementation of Mitigation Measures 5.6-3(a) through 5.6-3(d) taken together would avoid direct and indirect impacts to, and preserve, the majority of serpentine bunchgrass habitat occurring on-site, and the impact would be reduced to a less-than-significant level.

Mitigation measure 5.6-3(a) may require the relocation or elimination of proposed Lots 1 through 3 as well as the reconfiguration of Lots 6 and 19. Due to the site’s environmental constraints, it may be found not feasible to redesign the PDP as discussed in Mitigation Measure 5.6-3(a) without causing other impacts. However, as discussed above, no other feasible measure (such as the purchase and preservation of off-site habitat or the creation of compensatory habitat on-site) is available as an alternative to Mitigation Measure 5.6-3(a) which would provide a comparable level of mitigation. Therefore, if Mitigation Measures 5.6-3(b) through 5.6-3(d) are implemented in the absence of 5.6-3(a), while impacts to native serpentine bunchgrass habitat would be reduced (as a result of the elimination or reduction of indirect impacts and the in perpetuity preservation and management of remaining preserved habitat via the RMP), they would not be reduced to a less-than-significant level and this would be a significant unavoidable impact.

**Responsibility and Monitoring** The applicant would be responsible for redesigning the PDP and submitting it to the County for approval. The applicant would also be responsible for developing and determining a funding mechanism for the Resource Management Plan for preserved lands, and may also be responsible for initial activities required under the Plan, such as installing protective fencing or signs. However, once the preserved areas are dedicated to the MCOSD or other approved public agency or non-profit, the latter would assume all responsibilities required under the Plan.

**Impact 5.6-4 Loss of Coast Live Oak Woodland**

Project implementation would result in the loss of between 7.9 and 12.8 acres of coast live oak woodland and at least 742 trees as a result of infrastructure and home development, landslide repairs and compliance with Urban-Wildland Interface Restrictions. An unknown number of additional trees would be lost as a result of improvements along Paradise Drive at Forest Glen Court which may result in up to another estimated 0.5 acres of woodland habitat loss. This would be a significant impact.

The PDP proposes to permanently preserve an estimated 35.1 acres (76 percent) of coast live oak woodland habitat on-site within Parcel A and dedicate these preserved lands to the MCOSD for control and management. Assuming a worst case scenario (i.e. assuming this habitat is removed from all lots where it occurs, inclusive of the private use areas of the lots outside their building envelopes), the PDP would impact 12.3 acres, or approximately 26 percent, of the oak woodland habitat on site result of infrastructure and home development, landslide repairs and compliance with Urban-Wildland Interface Restrictions. Most of this loss would occur in the Forest Glen portion of the project (Lots 25 through 34). Under the best case scenario (assuming all woodland habitat is retained within the private use areas of lots where it occurs and only would be lost within the building sites of Lots 14, 23, and 25 through 34), the impact would be reduced to approximately 7.4 acres, or approximately 16 percent of the woodland habitat on-site. The reality is that the actual impact would likely be somewhere between these two scenarios. The proposed project would also require improvements along Paradise Drive at Forest Glen Court. These improvements would include establishing adequate sight line in both directions for vehicles entering Paradise Drive from Forest Glen Court. These improvements would require that the banks in this location are graded and that retaining walls are installed along both sides of Forest Glen in this location that would extend up Forest Glen. Primarily, these improvements would impact coyote brush scrub habitat which occurs to the north of the
intersection and areas already developed as a result of the existing access road shoulders, however, to the south of the intersection, these improvements would result in some permanent removal of woodland habitat, estimated at less than 0.5-acre. Therefore, potentially 12.8 acres of woodland habitat (approximately 27 percent) could be permanently lost at project buildout in a worst case scenario (i.e. if lot owners remove all woodland vegetation from their private use areas) and 7.9 acres (approximately 17 percent) in a best case scenario if all lot owners retain woodland vegetation within their private use areas. Lastly, landslide repairs proposed in the PDP would result in some additional temporary impacts as well as minor permanent impacts to woodland habitat preserved in Parcel A. These include temporary impacts from the trenching of four subdrains and the installation of five debris fences within preserved woodland habitats (see Exhibit 5.6-2).

A tree inventory was completed by the applicant for the site in 1999 and was used to complete the 2001 Draft EIR analysis of impacts to tree resources. 79 This analysis was updated by the applicant’s consultant in 2008. 80 Based on information contained in the tree surveys, it is estimated that 11,450 trees are present on the site, 81 and an estimated 742 of these trees (or approximately seven percent) would be removed as a result of project development, landslide repairs, and compliance with Urban-Wildland Interface Restrictions. The applicant indicates, however, that the exact number of trees to be removed would ultimately be based on the locations of homes within the individual lots where woodland impacts would occur.

Oak woodlands are declining in California due to cutting for wood, agricultural and urban development, flood control, and management practices leading to low tree regeneration. Although most oak forest types are not in immediate danger of eradication, concern for these communities has increased recently in the scientific community and resource agencies. There are approximately 80,000 acres of hardwood forest in Marin County. 82 According to Extent and Ownership of California Hardwood Rangelands, approximately 59,000 acres of these hardwood forests are dominated by coast live oak woodland. Of those latter woodlands, 29,000 acres are estimated to be closed-canopy woodlands similar to those growing on the project site. Most of the coast live oak woodland in Marin County occurs north of the site, and densely wooded lands on the Tiburon Peninsula (such as those on the site) occupy a relatively limited area in the far northeastern part of the peninsula.

The occurrence of SODS in Marin County has increased residents’ concerns about the oak woodland resources in the county. The University of California research team has identified most of the oak woodlands in Marin County as supporting the disease complex.

As part of their 2009 surveys, the EIR biologists collected data on the health of oak woodlands on-site to determine the probable occurrence and extent of SODS on the site and to supplement information contained in the applicant’s updated tree survey report. 83 While it is currently not possible to determine with certainty the occurrence of SODS in the field (such identification requires lab

79 Easton Point Precise Development Plan, Prezoning / Annexation Request, Environmental Clearance (CEQA), Tree and Rock Outcrop Survey Point Description Listing, op. cit.
81 Estimate made by the applicant’s arborist based on dripline data provided Towil, Inc. in the 1980’s, 2008 Google Earth images, and the prior tree survey report.
82 Fire Hazards Created by Sudden Oak Death in Marin County, op. cit.
83 Live Oak Associates Ecologist Pamela Peterson and Botanist and Arborist Neal Kramer conducted two 300-foot point intercept transects along the gradient within three of the drainage watersheds of the site. Data on the species, size and health of trees encountered along the transects was recorded.
5.6 Biological Resources

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analysis), approximately 25 percent of trees encountered along the transects were either already dead or their health was significantly compromised, showing signs of Hypoxylon fungus and / or weeping sores (primarily coast live oaks and toyons) and it is the opinion of the EIR biologist that SODS is likely to be present on-site. Regardless, findings from the collection of the EIR biologist’s transect data, when combined with data from the applicant’s tree surveys, indicate that the woodlands of the site are in poor condition and are declining, and also indicate that of the 742 trees projected to be lost, as many as 185 would either be already dead, or would be likely to succumb to disease, within the next few years, regardless of whether or not development occurs on the site. That said, however, the loss of 557 reasonably healthy trees on the site, in a region where woodlands have been lost due to the combined effects of development and SODS, would be a significant loss.

In addition to direct impacts to oak woodlands on-site, potentially, the proposed development of the project site may also have indirect adverse impacts on the oak woodland plant community when combined with the occurrence of SODS in the region. This indirect impact would result from the additional environmental stress on trees on the site through soil compaction during construction (such as grading and site preparation) and also through on-going landscape irrigation once homes are occupied. Soil compaction of the root zone (the area under the crown plus one-third) and excessive irrigation have been cited by University of California SODS researchers as environmental stressors which can weaken the health of trees and make them more susceptible to the pathogen. Indirect adverse impacts may also occur due to the spread of the pathogen during activities such as tree trimming and removal which could increase the dispersal of the SODS fungus spores to surrounding trees not yet infected.

Lastly, the PDP proposes maintaining an easement on Parcel A to undertake any future work required for health and safety, including landslide stabilization and, to the extent that the MCOSD fails to maintain vegetation in accord with any future local, county and state fire safety standards, the ability to cut or clear vegetation on Parcel A in accord with any future fire safety requirements. Additional impacts from future fuel management activities on woodlands in Parcel A are difficult to predict, but potentially could result in additional future losses of woodland habitats on the site.

Woodland habitats, particularly when they occur within a mosaic of other habitats, support a diverse wildlife community. The loss of woodland habitat on a site represents impacts to not just trees but to the wildlife species that rely on them. Woodland habitats along the Tiburon Peninsula are especially valuable due to their proximity to the Bay, which results in their ability to support higher bird diversity than woodlands that occur more inland. This is due primarily to the increased use of these habitats (adjacent to the Bay) by neo-tropical migrants that find these areas useful for foraging and rest areas. Some factors that moderate the value of these woodlands for wildlife include: 1) the occurrence of low to moderate density residential development among and adjacent to the woodlands of the Tiburon Peninsula; 2) the presence of numerous paved roads dispersed through the woodlands; and 3) the fact that most hardwood forest in Marin County are infected to some degree by SODS. Considerable scientific research indicates the distribution and abundance of wildlife is adversely affected by the proximity of residential development and paved roads. While there is no quantitative measure to classify the value of the woodlands on the project site, it is reasonable to conclude that the value of the habitat for wildlife species is moderate given the unique character of the woodlands adjacent to the Bay combined with nearby human activity that reduces their overall value.

The applicant proposes to compensate for the loss of woodland habitat and the removal of trees by way of the planting of replacement trees on-site within Parcel A at the following replacement:loss ratios:

A 3:1 ratio for trees six inches diameter at breast height (DBH).
A 4:1 ratio for trees seven to 12 inches DBH.
A 5:1 ratio for trees greater than 12 inches DBH.

Even at the minimum 3:1 (replacement:loss) ratio, this would result in the planting of over 2,000 replacement trees on-site, which at generally accepted rates of 200 trees per acre would require a minimum of ten acres of suitable habitat on-site to accommodate replacement plantings. In the EIR biologist’s opinion, this would not be feasible as sufficient areas to conduct even a small fraction of these replacement plantings do not occur on-site. Additionally, based on the EIR biologist’s prior experience with tree loss mitigations in the Tiburon area for other projects, no off-site locations to carry out this mitigation are available in the project region. Therefore, completing this mitigation off-site would also not be feasible. Lastly, the planting of trees alone would not result in suitable replacement habitat for oak woodlands, which are generally considered valuable as a result of their complex of different vegetation layers (herb, vine, shrub and tree canopy) and not just the presence of trees. Therefore, an alternative that includes the in perpetuity preservation of existing woodland habitat on-site, combined with a management plan to improve the condition of woodlands on the site, represents a more feasible alternative.

Under the proposed PDP, with no relocation or elimination of lots, 35.1 acres of woodland habitat would be preserved within Parcel A, this would still result in an approximate minimum 3:1 preservation:loss ratio (4.8:1 under the best case scenario and 2.8:1 under the worst case scenario). The actual ratio would probably be slightly higher than 3:1 as it is considered likely that individual lot owners would retain most woodland habitat occurring on individual lots outside their building sites. However, the preservation of oak woodland at a 3:1 ratio alone, in the absence of an in perpetuity plan to enhance and manage preserved woodlands on the site as well as protect such woodland habitats from indirect impacts due to project construction would still result in a significant impact.

**Mitigation Measure 5.6-4** The applicant shall implement the following measures to reduce impacts to coast live oak woodlands to a less-than-significant level:

**Mitigation Measure 5.6-4(a)** Ensure the in perpetuity preservation, enhancement and management of oak woodland habitat remaining on-site after project development:

- The applicant shall dedicate all preserved woodland habitat on-site (Parcel A) to the MCOSD. Should no agreement be reached with the MCOSD regarding such a dedication, the applicant shall dedicate Parcel A to another public agency or non-profit approved by Marin County, as determined in consultation with all applicable resource agencies for control and management.

- Develop, implement and fund an RMP as set forth in Mitigation Measure 5.6-1(c). The RMP shall be developed to be consistent with Marin County’s Oak Woodland Voluntary Management Guidelines. The RMP shall also contain a Fuel Management Plan element to ensure that vegetation on preserved areas and adjacent private lots with the project site is maintained consistent with all current and future fire safety guidelines. The plan will include provisions for mitigating woodland impacts as a result of fuel management activities through woodland enhancement in unaffected areas of the site.

**Mitigation Measure 5.6-4(b)** Reduce or eliminate indirect impacts to preserved native trees and woodlands on-site or off-site as a result of project construction or long-term use of individual lots:
• Dispose of cut down trees in ways consistent with the most current recommendations of the University of California Oak Mortality Task Force 84 to reduce the likelihood of the spread of SODS to unaffected areas in the region, or to any potentially unaffected areas of the site (although it is likely that all woodland areas on-site and adjacent to the site are already infected). The applicant shall consult with the Oak Mortality Task Force to obtain a list of their recommendations, and these will be written into the CC&Rs.

• During project construction, the applicant or individual lot owners shall be responsible for protecting native trees and other woodland vegetation to be retained by erecting exclusionary fencing around the root zones of trees that will be retained or at the edge of woodland vegetation that will be retained to ensure that retained woodland trees and other vegetation are not removed or indirectly impacted by soil compaction at the root zone by heavy equipment. The applicant shall ensure that these requirements are written into the CC&Rs.

Significance after Mitigation Implementation of Mitigation Measure 5.6-4(a) and 5.6-4(b) taken together would reduce project impacts to oak woodlands to a less-than-significant level (although this would not result in less-than-significant impacts as a result of the loss of ordinance-size trees (see Impact 5.6-8 Loss of Ordinance-Size Trees)). These mitigations would result in the in perpetuity preservation, enhancement, and management of oak woodlands on-site at an approximate minimum 3:1 preservation:loss ratio (or possibly as high as a 5:1 preservation:loss ratio assuming the best case scenario), and the in perpetuity preservation of trees at an approximate 15:1 preservation:loss ratio. These measures would also eliminate or reduce to a less-than-significant level any indirect impacts to remaining trees on-site.

Responsibility and Monitoring The applicant would be responsible for developing and implementing the RMP for any on-site preserved woodland habitat. Once the MCOSD or other approved public agency or non-profit takes over control and management of any preserved lands, they would assume responsibility for implementing the RMP. The applicant and/or the Property Owners Association would be responsible for funding the RMP. The applicant will also be responsible for writing measures into the CC&Rs that would ensure that BMPs are followed to preclude the spread of SODS as the result of the removal of trees and to protect native trees and woodland vegetation on individual lots during home construction. The applicant and individual lot owners would be responsible for carrying out these latter measures during infrastructure and home construction activities, respectively.

Impact 5.6-5 Disturbance to Jurisdictional Waters

Proposed landslide repairs would result in permanent and temporary impacts to areas potentially considered jurisdictional by USACE, RWQCB and CDFG. This would be a significant impact.

Of the 0.94 acres of seasonal wetland habitat that has been identified by EIR biologists on the site, the PDP proposes to preserve 0.87 acres (or 92 percent) within Parcel A to be provided permanent protection through dedication of Parcel A to the MCOSD. The remaining 0.07 acres consists of a wetland that drains into Drainageway 1 which occurs on the private use area of Lot 16, but approximately 50 feet outside of that lot’s proposed building envelope. Additionally, the PDP proposes to avoid impacts to the seasonal drainageways on site from infrastructure and lot

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84 Current recommendations for the management of SODS is available on-line at http://www.suddenoakdeath.org
development with a minimum 100 foot buffer and to permanently preserve the majority of the drainageways within Parcel A. An exception to the latter is that the upper portion of Drainageway 1 occurs within the private use areas of Lots 17 and 18, and the upper portion of Drainageway 2 occurs partially within the private use areas of Lots 11 and 12, but 100 feet or more outside of proposed building sites for those lots.

In addition to the seasonal wetlands and drainageways identified by the EIR biologist, as indicated before, the EIR hydrologist also identified several other small hydrologic features on the project site. These include three seeps (one along the boundary of Lot 10, one along the boundary of Lot 14 and one within coyote brush scrub habitat on Parcel A); two springs (one on Lot 8 near the boundary with Old St. Hilary’s Open Space Preserve and one occurring on the Keil parcel centrally located on the project site which is covered by a box and piped down to Keil Pond); and one seasonal pond located northeast of the Keil parcel spring. None of these latter features were observed to support hydrophytic vegetation (i.e. wetland habitat) in the many biological surveys that have been conducted for the prior and present EIRs. Based on the hydrologist’s observations, not all of these features were visible or active during one or more of their own surveys and not all supported wetland vegetation. For instance, in a hydrology survey conducted following the wet winter of 1995, only one such feature was observed to be active and this consisted of the spring near the boundary with Old St. Hilary’s Open Space Preserve. Based on the foregoing, it appears that these features may only be evident during very wet years and even then, may never support wetland vegetation or may only support wetland vegetation very briefly following a wet winter. These latter hydrologic features identified by Clearwater Hydrology occur either on Parcel A or outside the building sites of Lots 6, 10, and 14 and therefore they would not be directly impacted by either infrastructure or lot development. The spring occurring along the site boundary would be impacted by the installation of a subdrain. The subdrain installation would result in some temporary disturbance but also is expected to dewater this area which may cause the loss of any associated wetland vegetation. Since a formal wetland delineation has not yet been conducted for the project site, the extent to which these areas may be considered jurisdictional waters is unknown. If some are claimed, the total area of potentially jurisdictional waters occurring on the site may be very slightly higher than the 0.94 acres estimated, but probably by not more than 0.01 acres.

While infrastructure and lot development are not expected to result in impacts to drainageways, wetlands or other hydrologic features on-site, proposed landslide repairs would result in temporary and permanent impacts to such areas. These impacts include the installation of subdrains within Drainageway 2, below the confluence of the upper two segments of Drainageway 3, and within the spring on Lot 6 near Old St. Hilary’s Open Space Preserve; the installation of debris fences at the lower ends of Drainageways 2 through 5; and the installation of a buried pier and grade beam wall along the upper edge of the wetland on Lot 16. The installation of the subdrains would require excavating a trench of between three and six feet in width, however, the area of impact, due to the use of heavy equipment on either side of the trench, could be much wider. The subdrains would eventually be covered; therefore, impacts from their installation would not result in a permanent impact to the drainageways, however. The hydrologist indicates that the installation of the subdrain on Lot 8 would result in the dewatering of the associated spring and the permanent loss of associated wetland vegetation. Additionally, the installation of the debris fences would result in some minor permanent impacts to the site’s drainageways. The installation of the buried pier and grade beam walls would also result in some temporary impacts to the seasonal wetland on Lot 16 as a result of excavation for the buried piers, and the above surface grade beam wall would likely result in some

85 Live Oak Associates communication with Dave Snyder, Snyder & Wilson (EIR Geologist), September 2009.
minor permanent impacts to this wetland. Total permanent wetland impacts from the project are estimated at less than 0.01 acre.

Although no formal delineation of jurisdictional waters has yet been conducted for the site, the drainageways and wetlands of the site may be considered jurisdictional by USACE, RWQCB and CDFG. Therefore, these areas would be subject to the permit authority of USACE pursuant to Section 404 of the Clean Water Act, the RWQCB pursuant to Section 401 of the Clean Water Act, and also would require a Stream Alteration Agreement from the CDFG. Impacts to wetlands and other jurisdictional areas would be significant.

Additionally, the CWP places a high priority on the protection of wetlands (Policy BIO 3.1) and riparian habitats (Policy BIO 4.1), advocating the complete avoidance of impacts to these areas wherever possible and the establishment of Wetland Conservation Areas (WCAs) or Stream Conservation Areas (SCAs) over these areas which include minimum development setbacks ranging up to 100 feet.

**Mitigation Measure 5.6-5** The following mitigation measures when implemented would result in a less-than-significant impact to wetlands and other jurisdictional waters on the site.

**Mitigation Measure 5.6-5(a)** Ensure the in perpetuity preservation of wetlands and drainages remaining after project development:

- The applicant shall dedicate all preserved wetland and drainage habitats on-site (Parcel A) to the MCOSD. Should no agreement be reached with the MCOSD regarding such a dedication, the applicant shall dedicate Parcel A to another public agency or non-profit approved by Marin County, as determined in consultation with all applicable resource agencies (USACE, RWQCB, and CDFG) for control and management.

- Develop, implement and fund an RMP for preserved wetland and drainage habitats as set forth in Mitigation Measure 5.6-1(c).

**Mitigation Measure 5.6-5(b)** Compensate for impacts to wetlands and other jurisdictional waters as a result of project development:

- Conduct a formal wetland delineation of the site and have it verified by USACE. The applicant shall further calculate the extent of all permanent and temporary impacts to jurisdictional areas and apply to USACE for a Clean Water Act permit to comply with Section 404 of the Clean Water Act, shall obtain a Section 401 Water Quality Certification (or waiver) from the Regional Water Quality Control Board (RWQCB), and shall enter into a Streambed Alteration Agreement with the California Department of Fish and Game (CDFG) to comply with Section 1601 of the California Fish and Game Code.

- Prepare a Wetland and Riparian Mitigation and Monitoring Plan to be included in the RMP. The Plan shall include, at a minimum, the following requirements:

  - Replacement of lost wetland habitat acreage, including wetland habitat that would be lost as a result of the de-watering of the spring on Lot 8, at a ratio sufficient to retain functions and values. A 2:1 replacement:loss ratio would be expected to off-set wetland resource impacts adequately. Sufficient opportunities appear to be available on-site to carry out this replacement and may be combined with mitigations for a loss of CRLF habitat on-site (see Mitigation Measure 5.6-2).
Establishment of a minimum 100-foot setback between all drainageways and wetlands from proposed lot building sites and infrastructure development; and the development of a plan to mitigate for all temporary or permanent impacts that encroach within the setback, such as for landslide repairs. Temporary encroachments shall be mitigated through the development of a restoration plan to re-vegetate disturbed areas; while permanent encroachments shall be mitigated through the enhancement of habitat at a minimum 2:1 ratio.

The development of quantifiable performance measures and final success criteria and remedial measures to be implemented should created, restored or enhanced wetland and drainageway habitats fail to meet performance measures and success criteria.

Once-annual monitoring of created, restored or enhanced wetland and drainageway habitats for a minimum five-year period (longer should they not meet the final success criteria after five years), until they meet the final success criteria.

**Significance after Mitigation** Implementation of Mitigation Measure 5.6-5(a) and (b) would reduce impacts to wetlands and other jurisdictional waters to a less-than-significant level and be consistent with wetland and riparian habitat goals and policies contained in the Countywide Plan.

**Responsibility and Monitoring** The applicant would be responsible for conducting the wetland delineation, applying for permits from USACE, RWQCB and CDFG, and complying with all permit requirements. The applicant would be responsible for the development and implementation of the Wetland and Riparian Mitigation Plan, and State water quality permit requirements before the County issues a grading permit. The applicant would be responsible for submitting evidence to the County before receiving a grading permit which shows that suitable off-site areas to accommodate any off-site compensation have been located. The USACE, RWQCB and CDFG would monitor their respective requirements.

**Impact 5.6-6 Introduction of Invasive Exotics**

Non-native plants used throughout the site in landscaping of lots or roads could become established in preserved habitats occurring on- or off-site. The importation of fill materials to the site could result in the accidental introduction of invasive exotics to preserved habitats occurring on- or off-site. This would be a significant impact.

Landscaping and construction activities, such as the importation of fill materials or landscaping with invasive exotics may introduce additional exotic plants to the project site which are capable of naturalizing in native habitats and reducing the diversity of native plants on the site. The following mitigation would be required to reduce impacts to a less-than-significant level.

**Mitigation Measure 5.6-6(a)** The applicant shall have a qualified botanist or horticulturist develop a list of all exotic plants which are known to readily naturalize in habitats similar to those found on the project site. Black locust, blue gum, various brooms, periwinkle, pampas grass, non-native annual grasses and other species known to be invasive and difficult to eradicate shall be placed on this list and shall be prohibited from use in landscaping by applicant or individual lot owners by way of CC&R restrictions. All applicant or lot owner landscaping plans shall be submitted to Marin County CDA-Planning Division for approval.

**Mitigation Measure 5.6-6(b)** As set forth in Mitigation Measure 5.6-1(c), the RMP shall include a monitoring and management plan for non-native and / or invasive species, or pathogens, considered detrimental to protected resources (weed abatement, SODS management, CRLF predator control, etc.).
**Significance after Mitigation** Implementation of Mitigation Measure 5.6-6 would reduce this impact to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for submitting landscaping plans (for areas along roads, etc.) to Marin County CDA-Planning Division for approval. Individual lot owners would be responsible for submitting landscape plans for their individual lots to the County for approval.

**Impact 5.6-7 Disturbance to Active Bird Nests**

Construction activities could result in incidental impacts on birds of prey (raptors) and other birds which are protected by State and federal statutes should they be nesting on the site during project implementation. This would be a significant impact.

Several species of raptors (eagles, hawks, and owls) breed regionally. Raptor species which may breed on or near the site include, but are not limited to, red-tailed hawks, Cooper’s hawks, American kestrels, barn owls, and great horned owls. Additionally, many other resident or migratory bird species could potentially breed on the site within woodland and scrub habitats. Construction activities could result in the abandonment of active nests or direct mortality to these birds. State and federal laws protect raptors as well as other native resident and migratory bird species, and any construction activities which adversely affected nesting or resulted in the mortality of individual birds could violate State and federal law and would be a significant impact.

**Mitigation Measure 5.6-7** Construction (roads, buildings, etc.) within 250 feet of trees or scrub habitats (the standard construction buffer) shall require a pre-construction survey for active bird nests if such project disturbance occurs during the breeding season. The applicant shall implement and add to the project’s CC&Rs, for implementation by the individual lot owners, developers of lot clusters, and, subsequently, the POA, the following measures to reduce impacts to nesting birds:

- Within 30 days of beginning construction during the nesting season (February to August), have a qualified biologist survey construction areas and their immediate vicinity (within 250 feet) for active nests. Surveys shall be conducted according to a protocol developed in consultation with the CDFG.

- Mark any active nests discovered during the pre-construction survey on a map and determine and establish an appropriate construction-free setback or buffer around each active nest by means of fencing or stakes with conspicuous flagging. The appropriate size of the buffer will be determined by the biologist based on the species and topography. No construction activities shall be permitted within the buffer area until all young have fledged and are observed by a qualified biologist to be foraging independently of the parents.

**Significance after Mitigation** Implementation of Mitigation Measure 5.6-7 would reduce potential impacts to nesting raptors to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for conducting pre-construction surveys before start-up / site preparation and the construction of any infrastructure. The applicant would also be responsible for incorporating pre-construction survey requirements into the CC&Rs. The future owners of lots which support woodland and / or scrub habitats (or are within 250 feet of such habitats) would be responsible for conducting pre-construction surveys (pursuant to the CC&Rs) if tree removal or construction would occur during the breeding season (February to August). The applicant or individual lot owners / developers would need to submit a report to the County clearing their site(s) before issuance of a grading permit.
Impact 5.6-8 Loss of Ordinance-Size Trees

Project implementation would result in the loss of 742 trees as originally proposed as well as an unknown number of additional trees as a result of road improvements at the intersections of Paradise Drive and Forest Glen Court due to the need to provide adequate sight distance. Many of the trees that would be lost are native species that would be considered ordinance-size by the County. This would be a significant impact.

The proposed project would result in the loss of 742 trees as a result of infrastructure and home development, landslide repairs and compliance with Urban-Wildland Interface Restrictions. Additionally, improvements along Paradise Drive (see Impact 5.6-4 Loss of Coast Live Oak Woodland) would result in up to another 0.5 acre of woodland habitat loss and an unknown number of additional trees. Many of the trees that would be lost are native trees that would be considered ordinance-size pursuant to the County’s Native Tree Preservation ordinance. These consist of coast live oak with a diameter-at-breast-height (DBH) of at least six inches, California bay with a DBH of at least ten inches, and California buckeye with a DBH of at least ten inches.

As indicated in Impact 5.6-4 Loss of Coast Live Oak Woodland, the applicant has proposed to mitigate the loss of all trees on-site, not just ordinance-size trees, at a minimum ratio of 3:1 (replacement:loss) and has proposed to conduct this mitigation on-site within Parcel A. However, this mitigation would result in a minimum of 2,000 replacement plantings (and possibly as high as 3,000 replacement plantings), and would not be feasible as suitable areas to carry out even a small fraction of the proposed mitigation simply do not exist on-site without significantly altering the current mosaic of habitats on-site. Further, prior experience attempting to locate suitable sites for replacement trees in the project region for other projects have shown that suitable sites are not available even off-site to conduct this scale of planting effort. Even if this mitigation were only carried out for ordinance-size trees, there likely still would not be feasible on-site or off-site locations to carry out the number of replacement plantings that would be required; therefore, an alternative to replacement plantings would likely be necessary to mitigate this impact to a less-than-significant level.

Mitigation Measure 5.6-8 The loss of ordinance-size trees shall be mitigated by implementing the following mitigations measures.

- Prior to site preparation, landslide repairs, and the construction of infrastructure, the applicant shall be responsible for submitting a report to the County advising on the number of ordinance-size trees to be removed by these activities. Prior to the development of their individual lots, individual lot owners would also be responsible for submitting a report to the County with the number of ordinance size trees that would be removed on their private lots. The requirement that individual lot owners provide this information shall be written into the CC&Rs by the applicant. Currently, it is unknown how many of the 742 trees that would be lost would be considered ordinance-size; however it would not necessarily be required that additional tree surveys are completed as this information can be easily extracted from data collected by the applicant’s arborist in 2008 to supplement the original tree survey report.

- The applicant and individual lot owners shall be allowed to mitigate up to 25 percent of lost ordinance-size trees by incorporating tree plantings into their landscape plans for approval by the County, consistent with provisions contained in the Marin County Code Chapter 22.27 (Native Tree Protection and Preservation). Any replacement plantings shall consist of SODS-resistant tree species native to Marin County for the remaining 75 percent of ordinance-size trees to be removed, the applicant or individual lot owner shall pay a fee in the amount of $500 for each ordinance-size tree that will be removed into the RMP endowment fund. These funds shall be earmarked to manage and enhance preserved woodlands on the site through RMP activities such as the removal of non-native invasive plants, SODS management, replacement of dead or dying...
trees, etc., as well as to fund the re-establishment of woodland vegetation in areas that will be temporarily impacted as a result of landslide repairs.

- The applicant shall be responsible for mitigating the loss of ordinance-size trees as a result of site preparation, landslide repairs and infrastructure development; while the individual lot owners shall be responsible for mitigating the loss of ordinance-size trees as a result of development on their individual lots.

**Significance after Mitigation** Implementation of Mitigation Measure 5.6-8, along with Mitigation Measure 5.6-4 would reduce potential impacts to ordinance-size trees to a less-than-significant level.

**Responsibility and Monitoring** The applicant would be responsible for submitting to the County the total number of ordinance-size trees that would be removed as a result of site preparation, landslide repair and the construction of any infrastructure, and would be responsible to pay any applicable fees for this loss prior to the County issuing a grading permit; the individual lot owners would have the same responsibilities for their own lot development. The applicant would be responsible for writing this requirement into the CC&Rs, including the amount of fees to be paid per ordinance-size tree removed.
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5.7 PUBLIC SERVICES
The impact analyses of the following public service and facility topics are presented in this section. Public scoping comments regarding the project’s impacts to public services were received by Marin County in February 2009. Particular concerns include fire flow and water pressure requirements; emergency evacuation; emergency vehicle access; water supply and impacts associated with the construction of the proposed water supply tank; impacts to existing sewer and wastewater treatment facilities; and impacts related to increased energy use. Also, concerns regarding the proposed project’s impacts on existing parks, recreation, open space and trail facilities were raised. 

The impact analyses of the following public service and facility topics are presented in this section.

- Fire Protection and Emergency Services
- Police Services
- Water Supply
- Wastewater Management
- Energy
- Public Schools
- Solid Waste
- Parks and Recreation Facilities

## Fire Protection and Emergency Services – Environmental Setting

The Tiburon Fire Protection District (TFPD) would provide fire protection and emergency medical services to the project site. The TFPD has two stations. Station Number 11 (the Headquarters station) is located at 1679 Tiburon Boulevard, and Station Number 10 (the Trestle Glen substation) is located at 4301 Paradise Drive. Both stations would be responsible for serving the project site. Existing personnel includes 20 paid firefighters (all EMT trained), 18 volunteer firefighters, and three reserve firefighters. Five paid firefighters are on duty at all times. Available equipment includes two Type-1 engines (designed for structural protection) and one Type-3 engine (designed for wildland fires) at the Headquarters station, and one Type-1 engine and one ambulance at the Trestle Glen substation. Service to the site is constrained by limited access along Paradise Drive which limits emergency vehicle speeds to approximately 25 miles per hour. Estimated response times for fire engines to the project site are five minutes from the Headquarters station and ten minutes from the Trestle Glen substation. In 2008 the Tiburon Fire Protection District responded to 1,382 incidents, of which approximately 67 percent were for medical aid.

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2 Tiburon Fire Protection Ordinance 122.
The TFPD has an automatic aid agreement with the Southern Marin Fire Protection District and the Corte Madera Fire District. In addition, the Marin County Mutual Aid Pact allows the TFPD to request aid from any department in the County.

MARIN EMERGENCY RADIO AUTHORITY (MERA)

In 1997 public safety agencies in Marin County began developing a proposal for a countywide emergency communication radio system to replace the obsolete communication systems that were used by individual emergency service providers. In February 1998, under a joint powers agreement, the Marin Emergency Radio Authority (MERA) was formed with the goal of providing a regional emergency radio communication system.

Today the MERA system consists of 17 sites, including the main processing site located at the Marin Civic Center. The system links communication between each agency, but also allows for each agency to maintain autonomous communication separate from the region. The MERA system has capacity constraints and is working to develop new antenna sites to increase coverage. Marin County has received public comments from the TFPD stating concern over a “dead zone” in the MERA system, where communications have been dropped in the area of the proposed project site.

In response to concerns expressed by the TFPD regarding the MERA coverage, on April 28, 2010 a reconnaissance of the project site was conducted. One purpose of the reconnaissance was to determine the level of emergency radio coverage in areas proposed for development on the project site. The level of emergency radio coverage was evaluated using two hand held portable radios that are part of the MERA system. Those participating in the reconnaissance represented Marin County, TFPD, MERA, the EIR consultant, and the project applicant.

The following is a summary of the findings:

- At present there is a strong radio signal and adequate emergency radio coverage at the higher elevations on the project site.

- For the proposed project the emergency radio system coverage would be adequate for the three lots (Lots 1 through 3) to be accessed by Mountain View Drive, and the 27 lots that would be accessed by the extension of Ridge Road and Mt. Tiburon Court. There was one area in the vicinity of proposed Lots 18 and 12 where the radio signal was so strong from two different directions that they cancelled each other out. One solution to the problem would be to increase the strength of one radio signal over the other.

- At present there is a weak radio signal and inadequate emergency radio coverage at the lower elevations on the project site.

- For the proposed project the existing emergency radio signal and coverage would be inadequate in the area proposed for Lots 21 through 23 and the ten lots (Lots 25 through 34) proposed along Forest Glen Court.

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5 Marin County Community Development Agency communication with Ron Barney, Tiburon Fire Protection District, March 2, 2009.
• After reviewing the site plans and topography maps for the project site it appeared that a new radio facility located in the vicinity of the existing 47-foot tall Paradise Water Tank could possibly provide adequate radio coverage for all lower elevation lots (those located below elevation 290). It also is possible that a new radio facility at the existing water tank site could mitigate the area at the higher elevations were the existing radio signals cancelled each other out.

• It appears to be physically possible to locate a new radio facility next to the existing Paradise Water Tank on/near the MMWD property. MMWD approval would be required for any facility on the district’s property. A new facility design might consist of a new tapered monopole as high as the existing water tank with the two antennae extending above the tank. There would also be one microwave dish, a small radio building (ten-feet by 18-feet) and an emergency generator. It was estimated that new antennae at this location would be adequate to provide emergency radio coverage for all proposed development at the lower elevation.

WILDLAND FIRE HAZARD

Wildfire poses its greatest risk to human life and property within areas known as wildland-urban interface (WUI), where development occurs within undeveloped wildland and structures are located in close proximity to vegetative fuels. The project site for the proposed 2008 Easton Point Residential Development would be located within a WUI, and is shown in local plans as an area susceptible to wildfires. During a five year time span (2005-2009) 297 wildfires occurred in Marin County. New development in WUI’s is subject to the preventative fire safety requirements of the 2003 International Urban-Wildland Interface Code and the 2007 California Building Code Chapter 7A. The 2008 Easton Point Residential Development would be subject to both codes, and in cases where preventative fire safety requirements overlap the stricter requirements of the two codes would apply. In general, planning to enhance fire safety for new developments includes a combination of vegetation management and fire preventative construction methods. The following is a list of required standards from both the 2003 International Urban Wildland Interface Code and 2007 California Building Code Chapter 7A that would apply.

Requirements that affect the planning and design of a development proposed within a WUI include:

• Emergency vehicle access to each non-exempt individual structure.

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6 Town of Tiburon General Plan, Town of Tiburon, adopted September 7, 2005, Figure 6.3-5 Open Space and Vacant Land Susceptible to Wildfire.

7 Information obtained from Marin County Fire Department Database, Nichols • Berman communication with Scott Alber, Fire Marshal, July 20, 2010.

8 International Code Council, Amended and adopted by the County of Marin on July 11, 2006 (Ordinance 3453) codified as Chapter 16.17 Marin County Code.


- Clearly marked fire protection equipment.
- Conforming and visible address markers.
- Adequate water supply for fire suppression.
- Water supply testing, maintenance and standby power requirements for on-site water supplies.
- Fire protection (wildfire risk assessment) plans that analyze site-specific risk assessment for the project, location, topography and other related factors and;
- Vegetation management plans that catalogue landscape management measures, approved plants and maintenance to reduce fire hazard exposure (see information below).

Preventative structural standards from both codes include:

- Non-combustible roofing that prevents flame and ember intrusion.
- Gutter systems capable of preventing accumulation of leaves and debris.
- Attic and wall vents designed to resist flames and burning embers.
- Eave and soffits with exposed area constructed from non-combustible materials
- Skylight standards (per CBC)
- Exterior walls constructed with approved flame resistant materials and / or heavy timber.
- Enhanced standards for exterior glazing and doors.
- Underside of floor and supporting elements shall provide the same ignition resistance as walls.
- Standards for appendage and floor projections.
- Decking, exterior stairs, and porches shall be constructed with ignition resistant materials with the same standards applied to exposed undersides.
- Installation of automatic fire sprinkler systems.
- Restrictions to the location of fuel tanks, firewood, and other combustible materials.
- Chimney spark arrester standards
- Ancillary building and structure protection standards.

Preparation of Vegetation Management Plans includes the use of a Hazard Matrix and Fuel Modification Matrix to rate proposed development lots and suggest adequate fuel modification zones.
for a defensible space to reduce fire risk around structures in wildland areas. The *Hazard Matrix* takes into consideration the slope, aspect, and types of vegetative fuels located adjacent to structures. The *Hazard Matrix* rates particular lots by assigning “hazard points”, which is used to suggest adequate fuel modification zones for a defensible space. The *Fuel Modification Matrix* describes what type of vegetation and what amount of modification (removal, thinning, raising of tree crown, etc.) would be necessary to create a defensible space.

The applicant for the proposed *2008 Easton Point Residential Development* has provided landscape management plans that depict home ignition zones of up to ten-feet around the perimeter of each residence. Only small shrubs and ornamental trees would be allowed within the home ignition zones. Defensible space zones are 11 to 50-feet around the perimeter of each residence. In the defensible space zone regular trees are allowed but spaced far apart and well pruned. Fuel reduction zones are 50 to 100-feet around the perimeter of each residence. Within the fuel reduction zone all undergrowth must be removed, mature trees would be pruned and smaller trees would be thinned out. It is estimated that 742 trees would be removed due to individual lot development, Urban Wildlife Interface regulations, and landslide stabilization. Of this total it is estimated that 622 trees would be removed for lot development and Urban Wildlife Interface regulations (see Exhibit 3.0-6). In addition to compliance with vegetation management compliance, the project also proposes to construct a construction access road on-site. After construction, it is proposed that this road remain for emergency access only and would be blocked at either end by a barricade gate. The proposed circulation plan includes expanded turnouts that would allow emergency vehicles to pass private vehicles exiting the project site.

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**Fire Protection and Emergency Services – Significance Criteria**

The fire protection and emergency services analysis uses criteria from the *State CEQA Guidelines* and the Marin County Environmental Impact Review Guidelines. Based on the *State CEQA Guidelines*, the project would have a significant impact to fire protection and emergency services if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection services.

- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant environmental impact if it would:

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11 A fuel modification zone is a strip of land where combustible native or ornamental vegetation has been modified and / or partially or totally replaced with drought-tolerant, low-fuel-volume plants.
• Require additional fire staff, facilities or equipment to maintain an acceptable level of service (e.g. response time, rating, other)?

Fire Protection and Emergency Services – Impacts and Mitigation Measures

NO OR LESS-THAN-SIGNIFICANT IMPACTS

Based on the findings of the analyses completed as a part of this EIR it has been determined that the proposed 2008 Easton Point Residential Development would have no or less-than-significant impacts for the following significance criteria:

• Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

The proposed project would not interfere with any emergency response or evacuation plan, therefore further analysis is not necessary.

IMPACT ANALYSIS 12

Impact 5.7-1 Fire Service Impact

Project site development would result in increased service demands on the TFPD. However, the increase would not be significant. Proposed roads and driveways would not comply with all Tiburon Fire Protection District’s standards. The Tiburon Fire Protection District has indicated the project site is located in an area where there is limited emergency radio coverage, resulting in inadequate communication capabilities for emergency personnel. This would be a significant fire service impact.

The TFPD would be able to serve the project site. The TFPD could not estimate the number of service calls project residents would generate, but does not anticipate a significant increase in service calls resulting from the project. 13

Vehicle circulation for the proposed project would consist of roads that would be designed to meet standards of the TFPD (see Impact 5.1-9 Project Impacts Related to Emergency Access). The applicant is not proposing to dedicate the roads to Marin County. Rather the new roads would be private roads and maintained by the Property Owners’ Association. 14 With the exception of the construction access road, the project roads and driveways would comply with TFPD roadway grade requirements. The construction access road would have a 25 percent maximum grade and would not

12 Water supply for fire-flow is discussed below Water Supply. Emergency access for the TFPD is discussed in Impact 5.1-9 Projects Impacts Related to Project Site Emergency Access in Section 5.1 Transportation.

13 Nichols • Berman communication with Ron Barney, Fire Inspector, Tiburon Fire Protection District, April 2009.

14 The PDP proposes narrower roads than the design standards in the Marin County Code. The applicant has requested an exception to the County standards for the proposed road widths. The requested exception is analyzed in Impact 5.1-11 Provision of Safe On-Site Roads.
it is unlikely that the construction access road would be available for use by emergency vehicles. As discussed in Impact 5.1-9 in three locations driveways would be too narrow to meet TFPD standards and in four locations turnouts would be needed to meet TFPD standards.

Inadequate radio coverage would compromise fire services in the event of an emergency at the site. Based on the April 2010 site reconnaissance certain areas of the project site currently have a weak radio signal resulting in inadequate emergency radio coverage. In the past fire service personnel have lost radio signal in the vicinity of the project site.\textsuperscript{15} It is expected that there would be a weak radio signal and inadequate emergency radio coverage at the lower elevations on the project site, Lots 21 through 23 and Lots 25 through 34.

**Mitigation Measure 5.7-1** The applicant shall implement the following mitigation measures in order to reduce the project’s fire service impacts to a less-than-significant level.

**Mitigation Measure 5.7-1(a)** Same as Mitigation Measure 5.1-9.

**Mitigation Measure 5.7-1(b)** In order to reduce the significant emergency radio coverage impacts at lower elevations on the project site, the applicant shall prepare an emergency radio coverage improvement plan. The improvement plan shall clearly show that adequate emergency radio coverage can be provided for Lots 21 through 23 and Lots 25 through 34. The improvement plan shall be prepared in cooperation with the MERA. One possible method to provide the necessary radio coverage would include the following:

- Locate a new emergency radio facility in the vicinity of the existing MMWD’s Paradise Water Tank. The facility could be located either on the project site or possibly on the water tank site with MMWD permission. The facility design might consist of a new tapered monopole as high as the existing water tank with the two antennae extending above the tank. There would also be one microwave dish, a small radio building (approximately ten-feet by 18-feet) and an emergency generator.

**Significance after Mitigation**

**Mitigation Measure 5.7-1(a)** Same as Mitigation Measure 5.1-9.

**Mitigation Measure 5.7-1(b)** Implementation of Mitigation Measure 5.7-1(b) would provide adequate emergency radio coverage at the lower elevations of the project site and reduce the impact to a less-than-significant level.

**Responsibility and Monitoring**

**Mitigation Measure 5.7-1(a)** Same as Mitigation Measure 5.1-9.

**Mitigation Measure 5.7-1(b)** The applicant would be responsible to work with MERA to design an emergency radio facility that would provide emergency radio coverage at the lower elevations of the site. The applicant shall prepare the improvement plan for review and approval by MERA. MERA

\textsuperscript{15} Nichols • Berman communication with Ron Barney, Fire Inspector, Tiburon Fire Protection District, April 2009.
would be responsible to implement and/or oversee construction. The applicant would be responsible to fund its fair share of the improvement.

**Impact 5.7-2 Wildland-Building Fire Exposure**

*Development on the project site may expose houses and structures to wildland fire risks. With incorporation of 2003 Urban Wildland Interface Code requirements and TFPD requirements this would be a less-than-significant impact.*

The Precise Development Plan includes a conceptual landscape plan for the proposed project. As discussed above, the conceptual landscape plans have implemented the *Marin Fire Safe Guidelines for Defensible Space* as the primary source for establishing vegetation management procedures for the proposed project. 16 Vegetation management plans are proposed for each parcel that includes a home ignition zone, defensible space zones, and portions of wildland reduction zones which are spread throughout the project site including private property and common open space.

Inside the identified defensible space fuel modification is required to reduce the fire risks around structures. For example, all domestic gardens within 30 feet of structures are to be planted with fire resistant species and free of dead materials, tree crowns to be raised ten feet above ground, brush thinned, and debris removed from the ground. In addition, pyrophytic hardwoods must be thinned or removed if too dense near a structure. 17

The proposed 2008 Easton Point Residential Development would incorporate the requirements of both the 2003 International Urban-Wildland Interface Code 18 and the 2007 California Building Code Chapter 7A. 19 All developers of individual lots would be required to install automatic fire sprinkler systems and approved smoke detectors, consistent with Sections 10.306 and 10.305(e) of TFPD Ordinance 120. As discussed earlier, criteria required by these fire prevention codes includes preparation of Vegetation Management Plans, stronger structural standards to withstand flames and burning embers, and requires defensible space be maintained by property owners. Incorporation of these measures would substantially reduce the chance of a major wildfire starting on the project site or crossing the project site and destroying residences. Although the risk of wildfire would remain, the risk would be similar to that faced by many other homes in the Paradise Drive area and must be accepted if development is allowed in such wildland-urban interface areas. Therefore, incorporation of wildland-building measures would make this a less-than-significant impact.

**Mitigation Measure 5.7-2** No mitigation would be required.

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16 FIRESafe Marin is a non-profit organization dedicated to reducing wildland fire hazard and improving fire safety awareness in Marin. See www.FireSafeMarin.org.

17 Fuel Modification Matrix, Tiburon Fire Protection District. The Fuel Modification Matrix describes what types of vegetation and what amount of modification (removal, thinning, raising of tree crown, etc.) is necessary to create a defensible space. Pyrophytic trees are those with a high fire risk. California bay is considered such a species. The amount of pyrophytic vegetation present is known as the “fuel load”.


Impact 5.7-3  Cumulative Fire Service Impact
Cumulative development in the Tiburon Planning Area could generate additional demand for fire services which may require additional personal and equipment. This would be a significant cumulative impact.

Development on the project site together with cumulative development in the Tiburon Planning Area could generate additional demand for fire services from the TFPD. According to the TFPD, there are currently no plans to expand facilities and increase personnel to accommodate cumulative growth in the area. The TFPD has experienced an increase in call volumes, and consequently an increase in response times. The TFPD believes traffic increases resulting from cumulative growth has lead to delayed response times. The TFPD has considered conducting a Standards of Coverage study, which is an in-depth assessment of a fire agency’s resources in order to determine appropriate response times and the number of personnel needed to handle a variety of emergencies. 20 A Standard of Coverage study would include a survey of fire risks in the community (including all structures within the District). If such a study determined a need to expand equipment, personnel, and/or facilities the next step would be for the district to begin that planning process. According to the TFPD almost all emergency responses travel through Tiburon Boulevard, where significant traffic delays have occurred. The TFPD is considering an intersection traffic signal override system that can send radio signals from emergency vehicles to stop lights (within line of site) and alter the lighting to clear traffic ahead of the vehicle. 21 If cumulative development within the district requires additional personnel and equipment to maintain current performance standards, expansion of existing facilities may be required to accommodate the additional equipment. 22 The cost for additional TFPD staff and equipment could be at least partially offset by increased tax revenues generated by new development in the district. In the past the TFPD has considered fire mitigation fee for new development. To date no such fee has been adopted. This would be a significant cumulative impact and the proposed project may make a cumulatively considerable contribution.

Mitigation Measure 5.7-3  At the time future property owners apply for a building permit they shall pay any fire mitigation fee if such a fee is adopted by the TFPD.

Significance After Mitigation Payment of a fire mitigation fee (if adopted by the TFPD) would reduce cumulative impacts to a less-than-significant level. If no such fee has been adopted this would imply that the cumulative impacts of new development within the District had not reached the level to warrant collection of such a fee.

Responsibility and Monitoring The TFPD would be responsible to establish a fire mitigation fee and would be responsible to monitor its use.

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20 Further consideration of conducting a Standard of Coverage study is currently on hold. Nichols • Berman communication with Ron Barney, Fire Inspector, Tiburon Fire Protection District, December 2010.

21 Nichols • Berman communication with Ron Barney, Fire Inspector, Tiburon Fire Protection District, April 2009.

Police Services – Environmental Setting

The Marin County Sheriff’s Department would provide police services to the project site. The Sheriff’s Department provides a comprehensive system of law enforcement services, including patrol and investigation services for the purpose of ensuring the safety of the community.

The project site lies within Beat 13 of the Marin County Sheriff’s Office Area One Patrol District, which includes the City of Belvedere, the unincorporated community of Strawberry, and areas outside the Town of Tiburon. Beat 13 is one of three Beats located within the Area One Patrol District. Up to seven deputies patrol Area One at any given time, with at least one deputy dedicated to Beat 13. The Marin County Sheriff’s Office has a mutual aid agreement with the Town of Tiburon and the City of Belvedere. In emergency situations additional deputies are available from the Jail, Civil, and Court Divisions. The Area One Patrol District is served by the Marin City Substation, which is located at 850 Drake Avenue. 23

The Marin County Sheriff’s Office tracks crime statistics and service calls for particular Reporting Districts throughout their jurisdiction. The project site is located within the boundary of Tiburon Reporting District 1305, which spans the eastern side of the Tiburon peninsula and includes Spanish Trail Road, Teaberry Lane, Old Landing Road, and Paradise Cay. The Sheriff’s Department responded to 30 calls for service, including criminal investigations, traffic collisions, and suspicious circumstances within Tiburon Reporting District 1305 for 2009. 24

The California Highway Patrol (CHP) also has jurisdiction on Paradise Drive and has traffic enforcement responsibilities. Paradise Drive is within Beat 3 of the California Highway Patrol’s Marin service area, which is served by the Corte Madera station. CHP patrol of this portion of Paradise Drive is irregular, and officers respond to emergency calls as needed. CHP emphasizes patrol during weekends when traffic congestion between vehicles and bicyclist is heavy. 25

Police Services – Significance Criteria

The police services analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review Guidelines. Based on the State CEQA Guidelines, the project would have a significant impact on police services if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police services.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant impact on police services if it would:

23 Nichols • Berman communication with Lt. Cheryl Fisher, Marin County Sheriff’s Department, March 2010.

24 Nichols • Berman communication with Susan Medina, Crime Analyst, Marin County Sheriff’s Department, July 2010.

25 Nichols • Berman communication with Sergeant Osuna, California Highway Patrol Corte Madera Station, March 2010.
• Require additional police/sheriff staffing, facilities or equipment to maintain acceptable service ratios.

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**Police Services – Impacts and Mitigation Measures**

**Impact 5.7-4  Increased Demand for Police Protection Services**

The Marin County Sheriff’s Department would provide police protection to the proposed 2008 Easton Point Residential Development. The proposed project would not generate a substantial increase in calls for police services and would not require additional officers or improvements to the Police Department facility. This would be a less-than-significant impact.

Police services would be provided by the Marin County Sheriff’s Department. The Sheriff’s Department does not anticipate the proposed project would result in a substantial increase in calls for service. The project would not require additional officers, new or expanded facilities or additional equipment. The project, also, would not result in the need for additional staffing or equipment by the California Highway Patrol. This would be a less-than-significant impact.

**Mitigation Measure 5.7-4** No mitigation would be required.

**Impact 5.7-5  Cumulative Increased Demand for Police Protection Services**

Cumulative development in the unincorporated areas of Marin County could generate additional demand for police services which would require the addition of approximately seven deputies. Marin County is currently planning for development of a new Emergency Operations Facility that would house the Sheriff’s Department. This would be a less-than-significant cumulative impact.

Development of the project site together with cumulative development in unincorporated Marin County would add approximately 7,161 residents to unincorporated Marin County. The current level of service ratio for Marin County Sheriffs Department is 1.3 deputies per 1,000 residents. Accordingly the Marin County Sheriff’s Department would add approximately seven additional deputies to maintain the current level of service ratio. The proposed project is relatively small and would not significantly increase police service demands, resulting in a negligible contribution to cumulative demand increases on police services. With respect to facility expansion to accommodate anticipated increases in police staffing, Marin County is in the stages of planning for development of a new Emergency Operations Facility that would house the Sheriff’s Department, the Office of Emergency Services, the County Coroner, and other related services. This would be a less-than-significant cumulative impact.

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26 Nichols • Berman communication with Lt. Cheryl Fisher, Marin County Sheriff’s Department, March 2009.

27 Nichols • Berman communication with Sergeant Gilbert Osuna, California Highway Patrol Corte Madera Station, March 2009.

28 Marin Countywide Plan Update Draft EIR, Nichols • Berman and Marin County, January 2007, page 4.10-60

Mitigation Measure 5.7-5 No mitigation would be required.

Water Supply – Environmental Setting

The Marin Municipal Water District (MMWD) would supply water to the project site. MMWD facilities include seven water supply reservoirs, five water treatment plants, and various storage tanks, pumps, and water mains. Approximately 75 percent of MMWD’s water supply is provided from local watersheds. The remaining 25 percent of MMWD’s water supply comes from the Russian River in Sonoma County under a contract with the Sonoma County Water Agency. 30

The MMWD owns and maintains two water tanks in the vicinity of the project site. Each tank is described as follows:

- The 16-foot tall 160,000-gallon Hill Haven Water Tank is located just east of the northern end of Ridge Road, immediately south of the site, at an elevation of about 460 feet. This tank feeds a system of six-inch distribution lines throughout the Hill Haven neighborhood.

- The 47-foot tall 1,000,000-gallon Paradise Water Tank is located on a parcel surrounded by the project site at an elevation of approximately 230 feet. This tank feeds a 12-inch line which connects to a distribution line under Paradise Drive. From the connection point at Paradise Drive a six-inch main runs south towards the Town of Tiburon, and a ten-inch main runs north. 31

The Paradise Water Tank has an excess capacity and is considered adequate to supply water through its distribution lines at appropriate water pressures. The Hill Haven Water Tank has a limited capacity and existing homes that receive their water from the Hill Haven distribution system experience low water pressure. If the 2008 Easton Point Residential Development is approved, the MMWD plans to improve the water pressure of the distribution systems for residences on Mountain View Drive, Ridge Road, and Straights View Drive by connecting these lines to the distribution system for the proposed project. 32

In terms of water pressure for domestic water service, four levels of water service are provided throughout the MMWD. They include high pressure (80 pounds per square inch (psi) or greater, standard pressure (40-79 psi), low pressure 30-39 psi, and low pressure pump required (29 psi or less). In order to provide standard water pressure the mid-point of the water supply tank must be a minimum of 94 feet above the elevation of the highest water using fixture. 33 The MMWD will allow water service with sub-standard water pressure upon the condition that the owners enter into a low pressure

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31 Nichols • Berman communication with Michael Tarnoff, Land Development Solutions, April 6, 2009.

32 Nichols • Berman communication with Marin Municipal Water District staff, March 8, 2010.

33 There is an increase of one pound per square feet of water pressure for every 2.3 feet of vertical elevation. Therefore, approximately 94 feet of vertical separation is required for 40 pounds per square inch of water pressure. Nichols • Berman communication with John LaHaye, Marin Municipal Water District, November 2009.
agreement with the district, which serves as written release from liability for any damage or inconvenience related to the low water pressure. ³⁴

The MMWD states that water conservation is the cornerstone of their water supply management and sustainability strategies, and through working with the community has successfully reduced demand more than 20 percent of its peak in 1987. ³⁵ The MMWD Code contains a water shortage ordinance that would become effective during dry periods and includes provisions for water conservation plans, water waste prohibition, and water use budgets. ³⁶ The MMWD Code also contains a number of water conservation measures that would apply to the 2008 Easton Point Residential Development. These required conservation measures include water pressure regulating valves, high efficiency interior plumbing fixtures, pool covers, and requirements for landscaping that maximize the efficiency of irrigation.

As stated above the MMWD Code includes Water Efficient Landscape requirements, ³⁷ which would apply to the proposed project. The applicant would submit a Landscape Design Plan that complies with requirements for soil amendments, mulching, and soil conditioning. The requirements also regulate plant selection and grouping, and require irrigation devices such as rain sensors and point source and low-volume irrigation controls. Landscape Design Plans shall be accompanied by a calculated Maximum Applied Water Allowance worksheet which helps determine a site specific water budget and establishes a planting mix that, by design, would meet the water budget. In the case of the 2008 Easton Point Residential Development, compliance with the MMWD’s landscape requirements would be verified during the design review for each residential lot. Upon installation of landscaping applicants would submit a Certificate of Completion and a final inspection would be conducted by district staff. ³⁸

The MMWD currently has a water supply deficit and that deficit is projected to grow over time. ³⁹ The MMWD’s current projections for water supply conditions similar to a repeat of the drought of record (1976-77) anticipates a water supply deficit of 3,700 acre feet in 2010, 6,400 acre feet in 2020, and 7,400 acre feet in 2025. ⁴⁰ This means that in a drought year, water supplies from existing sources (e.g. Lagunitas Creek and the Russian River) would not be sufficient to meet demand.

³⁴ Marin Municipal Water District Code, Title 11 Water Service Rules and Regulations, May 2009


³⁶ Marin Municipal Water District, Title 13 Water Service Conditions and Water Conservation, May 9, 2009 and as amended by Ordinance 414, adopted December 16, 2009.

³⁷ Marin Municipal Water District, Ordinance No. 414 (amending Chapter 13.02 by adding Section 13.02.021), December 16, 2009.

³⁸ Ibid.


⁴⁰ Marin Municipal Water District, Ordinance No. 414 (amending Chapter 13.02 by adding Section 13.02.021), December 16, 2009
The MMWD is evaluating several options to increase its water supply to meet the projected demand. Currently the MMWD receives up to 14,300 acre-feet per year of water supply from the Russian River per a contractual agreement between the MMWD and the Sonoma County Water Agency (SCWA). This water is received from a single pipeline, owned by the North Marin Water District (NMWD) that extends from Petaluma to Novato. MMWD only has rights to utilize the surplus capacity available in this water line. Consequently as North Marin Water District demands on capacity of its pipeline increase the available surplus capacity to serve MMWD would decrease. Therefore, it would be very difficult for the MMWD to obtain additional supplies from the SCWA without construction of a new Sonoma-Marin pipeline. Recently, efforts to increase imported water from the SCWA were scuttled when the SCWA Board voted to abandon plans to increase its allotment of water received from the Russian River, and construct pipelines to deliver the water.

The MMWD has sought to increase its available supply through construction of a desalination plant. On August 19, 2009 the MMWD Board of Directors voted to approve a desalination project for a permanent plant that will initially produce five million gallons per day and be expandable to 15 million gallons per day of potable water. The MMWD is also pursuing opportunities to increase supply through revised reservoir operations and additional conservation activities.

The Tiburon Fire Protection District (TFPD) requires the installation of water mains capable of supplying the necessary fire flow at 20 pounds per square inch (psi) for two hours to approved fire hydrants, spaced at 350-foot intervals throughout new subdivisions. The fire flow requirement is 1,000 gallons per minute (gpm) for residences up to 3,600 square feet in size. For residences greater than 3,600 square feet the fire flow requirement is 1,500 gpm. Based on proposed home sizes, all larger than 3,600 square feet, the TFPD would require a water supply capable of providing a minimum of 1,500 gpm to fire hydrants for two hours, thus a minimum of 180,000 gallons.

The California Fire Code allows reductions in fire flow requirements if buildings are limited in size and / or contain features such as automatic sprinkler systems. For houses that are over 8,200 square feet, the 1,500 gallons per minute fire flow would be acceptable, but certain construction limitations are triggered. For houses over 8,200 square feet steel and concrete, but no wood, construction is required.

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45 Nichols • Berman communication with Dain Anderson, Marin Municipal Water District, April 2009.

46 For example the 2007 California Fire Code (Appendix B, Section B105) states that “the minimum fire-flow requirements for one- and two-family dwellings having a fire-flow calculation area which does not exceed 3,600 square feet shall be 1,000 gallons per minute”. Furthermore, it is stated that “a reduction in required fire flow of 50 percent, as approved, is allowed when the building is provided with an approved automatic sprinkle system”.

47 Nichols • Berman communication with Michael Tarnoff, LDS, Inc., April 2010.
The MMWD and TFPD would review the subdivision improvement plans to determine the appropriate water line size for adequate fire flow.

**DESCRIPTION OF THE PROPOSED ON-SITE WATER SYSTEM**

**Supply**

The proposed project would include construction of an 180,000 gallon water tank within a 0.25 acre parcel (Parcel C) that is located adjacent to the Old St. Hilary’s Open Space Reserve. The proposed tank location is at the highest elevation of the project site, where topography peaks at approximately 580 feet. A minimum vertical clearance of 94 feet between the elevation of the mid-point of the water tank and the highest water using fixture is required to achieve adequate water pressure to serve each resident. The nearest proposed houses (Lots 37 through 41) would be located downslope from Parcel C where existing topography peaks at 540 feet. The tank would be 20-feet tall with a 40 foot diameter, and would be constructed on an 80-foot wide pad at an elevation of 580 feet (see Exhibit 3.0-8). The PDP proposes to install 18 fire hydrants at required locations throughout the development which would be connected to nearby water mains via lateral pipes that could be four- to eight-inches in diameter. The exact size of each fire hydrant lateral would be determined based on what is needed to meet minimum fire flow requirements.

The existing Paradise water tank would serve as the primary source of water for the project site. The one million gallon capacity water tank is fed via a 12-inch water line that connects to a water main located within the Paradise Drive right of way. The existing 12-inch water main would be relocated to conform to the roadway alignment of Forest Glen Court. The applicant proposes to construct a new pump station at the Paradise water tank in order to pump water uphill, through a proposed eight-inch water line, to the proposed 180,000 gallon water tank that would be located on Parcel C. The water line connecting the Paradise water tank to the proposed tank would run through a 100 foot wide easement, which would also serve as an access easement for the proposed construction access road. An eight-inch water main would connect to the new water tank on Parcel C and run along the roadway alignments of the proposed residential roads.

**Distribution**

Lots 1 through 3 would be served by a six-inch water line located within a 15-foot wide utility easement that would connect to the proposed extension of Ridge Road. The six-inch line would connect to a segment of eight-inch main line in the vicinity of Lot 4, before reaching Ridge Road. Lot 4 would be served by a direct connection to the eight-inch water line. Lots 5 and 6 would each be connected via one-inch lateral water lines located within a 20-foot wide utility easement that also

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48 Other than the designation of a New Pump Station on the PDP Utility Plan (sheet C-3) the application materials submitted by the project applicant do not provide further details regarding the pump station.

49 The 100-foot easement is shown to allow the proposed construction access road and water main adequate room to be built within these limits. Once an actual construction plan has been prepared, the actual easement width would only need to be 25-feet (or larger, if that is required to maintain the grading and walls). Nichols • Berman communication with Michael Tarnoff, LDS, Inc., April 2010.

50 Nichols • Berman communication with Michael Tarnoff, LDS, Inc., April 6, 2009.

would serve as vehicle access to Ridge Road. Lots 7 through 9 would be connected to a six- or eight-inch water line (size to be determined by MMWD) located within a 30 foot wide access and utility easement. This water main would connect to the eight-inch water line located at Ridge Road. Lots 10 through 20 would have a direct connection to the eight-inch water line in Ridge Road.

Lots 21 through 23, proposed for the southern portion of the project site along Paradise Drive, would be served by a new six- or eight-inch water line located along the alignment of the 30-foot wide private access and utility easement and connect to the existing six-inch water main within the Paradise Drive right of way. It is assumed that Lots 25 through 28 would directly connect to the 12-inch water main at Forest Glen Court via one-inch pipes. Lots 29 through 31 would connect to the 12-inch water main via a one-inch diameter line located in the proposed 30-foot wide access and utility easement. Lots 32 through 34 would directly connect to the 12-inch water main located at Forest Glen Court.

Water Supply – Significance Criteria

The water supply analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review Guidelines. Based on the State CEQA Guidelines, the project would have a significant environmental impact if it would:

- Have insufficient water supplies available to serve the project from existing entitlements and resources;
- Could not be served by the MMWD due to insufficient potable water supply; or
- Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant impact on water supply if it:

- Proposes a significant increase in the consumption of potable water.
- Requires substantial expansion of water supply, treatment or distribution facilities?

Water Supply – Impacts and Mitigation Measures

Impact 5.7-6 Increased Water Demand

Development of the project site would increase water demand on the MMWD. However, the MMWD has sufficient capacity to serve the project site. This would be a less-than-significant impact.

The project site is located within the boundaries of the MMWD, and the district has stated that it can provide water service upon installation of an approved distribution system. 52 The MMWD estimates

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52 Marin County CDA communication with Joseph Eischens, Marin Municipal Water District, December 10, 2008.
the proposed project would consume approximately 0.49 acre feet of potable water per residential lot each year. This estimate is based on the average annual consumption for single family residences in the area. The MMWD is pursuing multiple strategies to meet projected water demand, with a priority to increase water conservation and minimize wasteful use. As stated earlier, the MMWD is currently experiencing a deficit in water supply, and in a very dry year would not be able to meet projected demands. However the proposed project, along with other residential uses within the district, would be required to comply with conservation measures and if necessary, mandated use reduction as described in the MMWD Code. Therefore the proposed project would have a less-than-significant impact on increased water demand.

Mitigation Measure 5.7-6 No mitigation would be required.

Impact 5.7-7 Water Service Impacts

The proposed project includes construction of a new 180,000 gallon water supply tank and distribution lines within the project site. Due to constraints with the proposed water supply and distribution system and additional constraints with the existing water lines located under Paradise Drive, some homes would not have the standard water pressures required for domestic water service. This would be a significant impact.

The existing Hill Haven and Paradise water tanks are not capable of providing adequate water supply to the project site. The proposed project includes construction of a new 180,000 gallon water supply tank on Parcel C within the project site, which along with the proposed distribution would meet the water service needs of the proposed development.

DOMESTIC WATER SUPPLY

As described above, in order to provide standard water pressure the MMWD requires that the highest water-using fixture in a structure be located no higher than 94 feet below the mid-point of the water serving tank. This provides the standard pressure of 40 psi for domestic water use. Water pressures on the project site may be less than the standard pressure.

At the request of the project applicant, in July 2009, the MMWD completed a preliminary water feasibility analysis for the proposed project. The results of the preliminary water feasibility analysis are shown in Exhibit 5.7-1. This analysis assumed a bottom water tank elevation of 575 feet. Based on the MMWD analysis 26 homes would have standard water pressure (40 psi and above). As many as 17 of the proposed homes, Lots 4 through 9, Lots 20 and 24, and Lots 35 through 43 would have low pressure (30 to 39 psi) or less. As a condition of receiving water service homes with water pressures below 40 psi would be required to sign a low pressure agreement with MMWD. In addition, homes with water pressures of 29 psi or less would be required to install a low pressure pump.

53 Nichols • Berman communication with Dain Anderson, Marin Municipal Water District, April 1, 2010.
54 Nichols • Berman communication with Dain Anderson, Marin Municipal Water District, April 2, 2009.
Exhibit 5.7-1
Water Feasibility Analysis

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Notes:
The estimated fire flow numbers are from a preliminary analysis of the water system prepared by MMWD and assumed a bottom tank elevation of 575. All flows are from the mid-level of the tank, and are 20 psi residual pressure minimum. These
figures are only an estimate, and do not represent real flows. Only a detailed construction plan will allow for more accurate design-level calculations.

A – This flow may be allowed by TFPD for homes greater than 3,600 square feet, but with conditions.
B – Would require upgrading water main along paradise Drive (from six inches to eight inches).
C – maximum size of any structure on this lot would be 3,600 square feet.


In order to resolve water pressure and water flow issues, the project applicant has investigated several modifications to the proposed water system. These include:

- In order to increase water pressure and flow to the upper elevation lots (generally Lots 1 through 3, 4 through 9, 20, 24, and 35 through 39) increase the elevation of the bottom of the proposed water tank from 580 feet to 590 feet.
- In order to increase water pressure and flow to proposed Lots 21 through 23, the applicant would upsize the existing six-inch water line located within the portion of Paradise Drive right of way that runs adjacent to the project site to an eight-inch line. The portion of the water line that would be upgraded extends from the location of the MMWD’s access road for the Paradise Water Tank to the location of the proposed driveway for Lots 21 through 23. The proposed Swahn residential project, located on Bluff Point, across Paradise Drive from the 2008 Easton Point Residential Project, proposes some improvements along its Paradise Drive frontage. It is proposed to replace approximately 745 feet of the existing six-inch water main located under Paradise Drive with an eight-inch water main to improve water pressure and fire flow at the project site. Completion of this work would reduce the amount of pipeline that the Easton Point applicant would need to upsize in order to improve water pressure and fire flow for Lots 21 through 23.

Mitigation Measure 5.7-7 In order to reduce water service impacts the applicant shall work with the MMWD to develop a water supply plan. The water supply plan shall clearly show that adequate water pressures would be provided to the new houses on the project site. The plan shall include the following:

- Increase the base elevation of the proposed water tank to 590 feet.
- Replace the existing six-inch water main in Paradise Drive with an eight-inch water main from the proposed driveway for Lots 21 through 23 to Forest Glen Court. The length of the pipe replacement would be approximately 3,750 feet.
- The applicant and / or property owners shall enter into a low pressure agreement with the MMWD that serves as a written release from liability for any damage or inconvenience

55 Initial Study Swahn Design Review and Second Unit Permit, Marin County Planning Division, January 2010.
56 Marin County Planning Division, Initial Study Swahn Design Review and Second Unit Permit, January 2010
associated with the low pressure domestic water service. If necessary the applicant or property owner must install a low pressure pump to provide adequate water pressure for the residence. 57

**Significance after Mitigation** Increasing the elevation of the proposed water tank and replacing the water main in Paradise Drive would reduce the number of homes on the project site that would have less than standard water pressure. By entering into an agreement with the MMWD to allow low pressure domestic water service individual property owners would be obligated to install any equipment necessary to provide enough water pressure for domestic use. Taken together, the individual components of Mitigation Measure 5.7-7 would reduce water service impacts to a less-than-significant level.

Implementation of Mitigation Measure 5.7-7 may result in secondary visual impacts. Increasing the elevation of the proposed water tank may result in the tank being slightly more visible than as discussed in Section 5.8 Visual Quality discussion of Impact 5.8-4 View from Ayala Cove on Angel Island 9 (Viewpoint No. 4).

**Responsibility and Monitoring** MMWD would be responsible for designing the water delivery system including the new 180,000 gallon water storage tank. The applicant shall pay MMWD for designing the water delivery system. The applicant’s contractor shall install the new water lines and water storage tank. MMWD would be responsible for monitoring and verifying construction of the water delivery system.

**Impact 5.7-8 Inadequate Fire Flow**

*As designed the proposed project would have houses located at elevations where, in relation to the elevation of the proposed water tank, the water pressure would not be adequate to provide minimum fire flow requirements. This would be a significant impact.*

As discussed above, the TFPD minimum fire flow requirement for fire hydrants that would serve homes greater than 3,600 square feet is 1,500 gallons per minute for a period of two hours with water pressure at 20 psi. 58 Fire flow requirements can be reduced based on the inclusion of certain additional protective measures in the house design.

Based on the preliminary feasibility analysis prepared by MMWD (see Exhibit 5.7-1) the minimum fire flow requirements would not be achieved for several lots. These include Lots 7 through 11, 19 through 24, and 35 through 43.

A lack of vertical separation from the elevation of the proposed water supply tank and fire hydrants combined with the static loss of water pressure would inhibit the available fire flow for the residential lots proposed at higher elevations. These include Lots 7 through 11, 19, 20, 24, and 35 through 43. The calculated fire flow for Lots 7 through 11, 19, and 20 through 23 are close to meeting the minimum requirements, and it is likely the TFPD would accept a reduced fire flow with mitigation to require upgraded building sprinkler systems and non-combustible construction materials for these

57 Marin Municipal Water District Code, Title 11 Water Service Rules and Regulations, May 2009

lots. Achieving acceptable fire flow for Lots 35 through 43 is more problematic and may require limiting the size of the homes on these lots as well as structural upgrades for fire safety.

Acceptable fire flow requirements for Lots 21 through 23 can be achieved by upgrading the existing water line located at Paradise Drive to eight inches from the proposed driveway for Lots 21 through 23 to Forest Glen Court.

Ultimately, houses sizes on the project site would depend on a number of factors besides fire flow, including the type of building construction, the fire resistance rating of materials used in construction, provision of automatic sprinklers, access to the structure, location of hydrants, vegetation management, and types of fire equipment available to suppress a fire. The final fire flow requirement for each future house on the site cannot be determined until the final building and landscaping plans, are presented to and evaluated by the TFPD.

**Mitigation Measure 5.7-8** In order to mitigate the project’s impacts resulting from inadequate fire flow the applicant shall execute the following through coordination with the TFPD and the MMWD.

**Mitigation Measure 5.7-8 (a)** Acquire approval of reduced fire flow requirements from the TFPD (as permitted in the 2007 California Fire Code) by implementing structural enhancements to proposed residences including but not limited to:

- Upgrades to building sprinkler systems
- Utilizing non-combustible exterior building materials

**Mitigation Measure 5.7-8 (b)** Limit the size of proposed houses (total allowable square footage) as needed to meet fire flow requirements.

**Mitigation Measure 5.7-8 (c)** Upgrade existing water line located in Paradise Drive to an eight-inch line in order to provide adequate water flow and pressure for fire flow requirements.

**Significance after Mitigation** Implementation of these mitigation measures would reduce the project’s fire flow impacts to a less-than-significant level through compliance with fire flow requirements by qualifying for reduced fire flow requirements, upgrading existing infrastructure to increase available fire flow, or reducing the proposed building square footage on certain lots to sizes that comply with fire flow calculations.

**Responsibility and Monitoring** The applicant would be responsible to implement Mitigation Measure 5.7-8, and should coordinate with the TFPD and the MMWD to ensure all requirements are met. Monitoring of this mitigation measure can be verified by Marin County by requiring written approval from the TFPD prior to issuance of building permits.

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59 Nichols • Berman communication with Michael Tarnoff, LDS, Inc., April 2010.

Impact 5.7-9  Cumulative Water Supply Impacts

Cumulative development would result in increased water demands. The project’s contribution to cumulative increases on water supply would be less than cumulatively considerable. This would be a less-than-significant cumulative impact.

The MMWD can currently supply 29,300 acre-feet of water per year from local reservoirs and imported water supplies. 61 As stated above the MMWD is currently experiencing a water supply deficit of 3,700 acre feet, and this deficit is projected to grow to 7,400 acre feet in the year 2025, based on water supply conditions similar to a repeat of the drought of record (1976-77). 62 The MMWD continues to pursue additional sources of water supply to meet project demand for the district. The recently approved desalination plant is anticipated to augment the available water supply. While the initial design of the desalination plant would have a capacity of five mgd, it can be expanded to 15 mgd.

Ongoing conservation efforts, which have reduced water demand by 20 percent less than the peak demand reached in 1987, will continue to be the centerpiece of MMWD water management strategies. 63 As stated in the MMWD’s 2007 Water Conservation Master Plan, 64 the district has the potential conserve up to 12,000 acre feet per year by the year 2025 through implementation of technical programs (installation of efficient plumbing fixtures, water metering devices, appliances) and behavioral programs (conservation education). 65

Furthermore, the MMWD Code has provisions to require voluntary and mandatory water use reductions within the district when reservoir levels meet certain low points. 66 A voluntary program to reach ten percent water use reduction can be enacted if on April 1st of any given year lake storage is below fifty thousand acre-feet and system modeling indicates a reduction of water use is required to assure sufficient carry-over of water supply storage. If on April 1st lake storage is below forty thousand acre-feet a mandatory reduction program can be enacted by the district for residential and commercial customers. This would be a 25 percent mandatory reduction that would include prohibitions restricting non-essential uses such as using potable water for decorative fountains or pools, irrigation between the hours of 11 AM and 7 PM, irrigation of new turf areas, washing of cars, boats, and airplanes with a hose without a shut-off nozzle. 67 With the current planning framework to reduce consumption and seek additional viable water resources, it is not anticipated that cumulative development within the MMWD would result in a significant cumulative impact on water supply.

62 Marin Municipal Water District, Ordinance No. 414 (amending Chapter 13.02 by adding Section 13.02.021), December 16, 2009
64 MMWD 2007 Water Conservation Master Plan, Maddaus Water Management, June 2007
65 Ibid
66 MMWD Code, Title 13, Chapter 13.02 Water Conservation and Dry Year Water Use Reduction Program, Marin Municipal Water District, May 2002.
67 Ibid.
The MMWD estimates the proposed project would consume approximately 21.07 acre feet of water annually, which represents 0.07 percent of the MMWD annual capacity. The proposed project would be subject to current as well as future conservation and reduction requirements of the MMWD. With that in mind the **2008 Easton Point Residential Development** would not have a cumulatively considerable contribution to cumulative impacts on water supply.

**Mitigation Measure 5.7-9** No mitigation would be required.

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**Wastewater Management – Environmental Setting**

Sanitary District No. 5 provides sanitary sewer service to the Town of Tiburon, City of Belvedere, and parts of unincorporated Marin County. Sanitary District No. 5’s service area extends from Trestle Glen (west) to San Francisco Bay (east). The district is responsible for the operation and maintenance of two sewage treatment facilities, 23 pumping stations and approximately six miles of pressure lines and approximately 33 miles of gravity sewer lines. After treatment the effluent is released into the Bay through an outfall pipe located 400 feet offshore in the Raccoon Strait. Some unincorporated properties within the geographic boundaries of the District’s service area are not served by Sanitary District No. 5 and use septic systems as an alternative. The project site is located outside of Sanitary District No. 5 existing service district’s boundaries, however it is within the District’s sphere of influence. If the **2008 Easton Point Residential Development** is approved, the applicant would construct on-site sanitary sewer facilities that would meet the requirements of Sanitary District No. 5, and request Sanitary District No. 5 annex the project site into its service district.

**Wastewater Treatment Plants** Sanitary District No. 5 operates two wastewater treatment plants - the Main treatment plant located at 2001 Paradise Drive on Point Tiburon and the smaller Paradise Cove treatment plant located at 3700 Paradise Drive. The proposed **2008 Easton Point Residential Development** would be served by the Main treatment plant.

The Main treatment plant has a design capacity to treat 0.98 million gallons daily (mgd) in dry weather conditions and 7.5 mgd in wet weather conditions. For 2008 the Main treatment plant had an average dry weather flow of 0.656 mgd, with an excess capacity of 0.32 mgd. During storm events in 2008 the Main treatment plant treated an average daily flow of 0.963 mgd. During these conditions wet weather infiltration averaged 1.5 to 2.0 mgd. The Main treatment facility operates under a National Pollutant Discharge Elimination System (NPDES) permit issued by the Regional Water Quality Control Board in 2006.

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68 Information obtained from Sanitary District No. 5 of Marin County communication with the Town of Tiburon in a letter from Robert Lynch to Scott Anderson dated April 23, 2009.


70 Information obtained from Sanitary District NO. 5 of Marin County communication with the Town of Tiburon in a letter from Robert Lynch to Scott Anderson dated April 23, 2009.

71 Nichols • Berman communication with Robert Lynch, District Manager Sanitary District No. 5, March 2009.
**Conveyance System** Sanitary Sewer District No. 5’s sewer system near the project site consists of two distinct subareas located along Paradise Drive and in the Hill Haven neighborhood. The first subarea is served by a six-inch collector running along the Paradise Drive right-of-way within the boundary of the Town of Tiburon. This collector line serves the eastern side of the peninsula. Sanitary District No. 5 anticipates the capacity of this line would be adequate to serve the site.  

The second subarea is in the Hill Haven neighborhood and is composed primarily of six-inch gravity fed lines. This system drains downhill to the south and connects to the main treatment plant via a 12-inch line along Mar West. The Hill Haven area benefits from a sloped elevation where gravity quickly clears flows and prevents capacity problems.

**Description of the Proposed On-Site Sewer System**

**Paradise Drive**

The PDP proposes construction of an approximately 4,800 foot long, four-inch diameter sanitary sewer force main in Paradise Drive from Forest Glen Court to approximately 800 feet south of the southern project boundary, where it would connect with existing sewer lines maintained by Sanitary District No. 5. The applicant would construct a manhole to facilitate this connection between new and existing sewer lines. All sewage from the project would be conveyed to this sanitary sewer force main at Paradise Drive. The PDP does not propose to utilize existing sanitary sewer facilities located in the Mountain View and Hill Haven neighborhoods.

**On-Site Sanitary Sewer**

According to the proposed PDP sewer collection and conveyance would consist of new sanitary sewer force main lines serving each cluster of residences, and connecting to the larger sewer main proposed at Paradise Drive. A network of sanitary sewer force mains would be installed within the right of ways of proposed residential streets and utility easements. At the time of EIR preparation the exact dimensions for the proposed sewer lines have not been determined.

Lots 1 through 3 would be served by a three-inch sanitary sewer force main via a 15 feet wide utility easement that would extend along the southern boundary of the project site from the location of Lots 1 through 3 to the proposed extension of Ridge Road. Lot 4 would have a direct connection to the three-inch sanitary sewer force main proposed within Ridge Road. Lots 5 and 6 would connect via a one or two-inch line located within a 20 feet wide access and utility easement that would connect to Ridge Road. Lots 7 through 9 would likely be served by a one and one half to two-inch diameter sewer force main located within a 30 feet wide access and utility easement, which would connect to Ridge Road. Lots 10 through 20 and 24 would be served by direct connections to the three-inch sanitary sewer force main within Ridge Road.

Lots 21 through 23, which would be located along the Paradise Drive frontage at the southern vicinity of the project site, would be served by a separate one and one half to two-inch diameter sewer line installed within a 30 feet wide access utility easement. This sewer line would follow the easement and connect to the proposed sewer main in Paradise Drive. Lots 25 through 28 would connect to a new two-inch sanitary sewer force main installed within the right of way of proposed Forest Glen Court.

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73 Nichols • Berman communication with Michael Tarnoff, Land Development Solutions, Inc., April 2009
Sewage from Lots 29 through 31 would likely be conveyed through a one and one half-inch to two-inch sanitary sewer force main located within a 30 foot wide access and utility easement, and would connect to the two-inch sewer main proposed at Forest Glen Court. Lots 32 through 34 would have direct connections to the two-inch sewer main proposed at Forest Glen Court.

Lots 35 through 43 would be served by direct connections to a one and one half to two-inch diameter sanitary sewer force main located within the Mt. Tiburon Court right of way that would extend south and connect with the sanitary sewer force main located at Ridge Road. The force main located at Ridge Road would continue southeast through a ten foot wide sanitary sewer easement that would travel through Lot 15, Parcel A (open space), and Lot 21 to a connection point with the four-inch sanitary sewer main proposed for the Paradise Drive right of way.

### Wastewater Management – Significance Criteria

The wastewater management analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review Guidelines. Based on the State CEQA Guidelines, the project would have a significant impact on wastewater management if it would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Result in the determination by the wastewater treatment provider, which serves or may serve the project that it has inadequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments;
- Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Violate any water quality standards or waste discharge requirements; or
- Otherwise substantially degrade water quality.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant hydrology, drainage, or water quality impact if it:

- Requires expansion of wastewater treatment or distribution facilities.

### Wastewater Management – Impacts and Mitigation Measures

**NO OR LESS-THAN-SIGNIFICANT IMPACTS**

Based on the findings of the analyses completed as a part of this EIR it has been determined that the proposed 2008 Easton Point Residential Development would have no or less-than-significant impacts for the following significance criteria:
• Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;

• Violate any water quality standards or waste discharge requirements;

• Otherwise substantially degrade water quality.

If the proposed project is developed wastewater would be conveyed to Sanitary District No. 5’s Main treatment plant. The treatment plant has adequate capacity to processes and treats wastewater in accordance with State and Federal Regulations under a National Pollution Discharge Elimination System (NPDES) Permit which regulates sanitary agencies. Therefore the proposed project would not exceed wastewater treatment requirements, violate any treatment standards, or substantially degrade water quality.

Impact 5.7-10  Increase to Wastewater Treatment Demand

Development of the project site would increase sewage treatment demands on Sanitary District No. 5. Existing facilities at the Main Treatment Plant would have sufficient capacity to serve the project. The additional flow would not require the construction of additional treatment facilities nor would it exceed wastewater treatment requirements of the Regional Water Quality Control Board or violate water quality standards. This would be a less-than-significant impact.

Based on an average household wastewater generation rate of 150 gallons per day (gpd), the proposed project would generate 6,450 gpd of wastewater. The main treatment plant has a current excess treatment capacity of 320,000 gpd (0.32 mgd) in dry weather conditions. Currently, there is sufficient capacity at Sanitary District No. 5’s Main treatment plant to serve the projected wastewater flows that would be generated by the proposed 2008 Easton Point Residential Development. Furthermore Sanitary District No. 5 anticipates no problems providing the necessary treatment. 74 No new or expanded treatment facilities would be required.

Mitigation Measure 5.7-10 No mitigation would be required.

Impact 5.7-11  Increased Cumulative Wastewater Treatment Demand

Cumulative development would increase sewage treatment demands on Sanitary District No. 5. Both wastewater treatment plants (Main treatment plant and Paradise Cove treatment Plant) have sufficient capacity to serve the project and planned cumulative development within Sanitary District No. 5’s service district and sphere of influence. This would be a less-than-significant impact.

Sanitary District No. 5 has recently upgraded the treatment capacity at its Paradise Cove Treatment Plant by replacing the 12,000 gpd facility with two 20,000 gpd prefabricated treatment plants. The new facilities allow Sanitary District No. 5 staff to perform maintenance on one treatment plant while performing maintenance on the other. The replacement for the Paradise Cove plant has been designed to ensure that adequate treatment capacity will be available to meet the needs of the buildout of the service area. 75 In 2008 the average daily flow was 8,644 gallons per day. The current NPDES permit allows for treatment of 20,000 gallons per day. When 80 percent of the permitted capacity is reached

74 Nichols • Berman communication with Robert Lynch, op. cit.
75 Ibid.
Sanitary District No. 5 will request an amendment to the current NPDES permit. While sewage from the proposed project would be treated at the Main treatment plan, the Paradise Cove treatment plant is designed for 40,000 gallons per day, and would be sufficient to treat cumulative growth along the Paradise Drive area.  

**Mitigation Measure 5.7-11** No mitigation would be required.

### Energy – Environmental Setting

**Energy Services**

Pacific Gas & Electric Company (PG&E) provides electricity and gas to approximately 15 million people throughout a 70,000 square mile service area that spans from Eureka to Bakersfield.  

Electricity supplied by PG&E is administered by the California Independent Systems Operator (California ISO), a private nonprofit organization created as part of California’s 1996 deregulation plan to monitor electricity use on the energy grid. The California ISO functions to purchase electricity as needed from suppliers on behalf of utility companies, such as PG&E, who are responsible for delivering the electricity to individual customers. The California ISO is responsible for administering electricity supply to approximately 124,000 square miles (75 percent of the state). PG&E has gas pipelines and overhead electrical lines along Paradise Drive that adjoins the project site.

**Energy Consumption**

Energy use is measured in kilowatt hours (kWh) and megawatt hours. The California ISO administers the procurement of 164 billion kWh each year. According to the California Energy Commission Marin County consumed 1,408 million kWh in 2005. 701 million kWh (49 percent) of

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76 Information obtained from Sanitary District No. 5 of Marin County communication with the Town of Tiburon in a letter from Robert Lynch to Scott Anderson dated April 23, 2009.


79 Nichols • Berman communication with Mindy Rayburn, PG&E Senior New Business Representative, April 2009.

80 A kilowatt is one thousand watts and a megawatt is one million watts. A kilowatt hour is one thousand watts consumed over one hour, while a megawatt hour is one million watts consumed over one hour.


this amount was consumed by residential uses. The average household of 2,500 square feet uses 10,079 kWh per year.  

**Regulatory Setting**

*State Energy Efficiency Standards for Residential and Non-Residential Buildings*

The California Energy Commission (CEC) is the primary energy policy and planning agency for the State of California. Created by the State Legislature in 1974, the responsibilities of the CEC include administration of the Title 24 Building Standards, which were established in 1978 in response to a legislative mandate to reduce California’s energy consumption. The Title 24 Building Standards require new construction to incorporate energy conserving methods to help accomplish efficient energy practices. The Title 24 Building Standards are updated regularly to allow incorporation of new energy efficient technologies and construction methods.

*Local Energy Efficiency Requirements*

Policy framework for local regulations that address energy conservation are contained in the *Marin Countywide Plan* in the form of Goal EN-1 - *Decreased Energy Use* and Policy EN-1.1 - *Adopt Energy Efficiency Standards*. Additionally, the Marin County Single-family Residential Design Guidelines contain Policy E-1.1, which states “Residential design should include green building measures that are energy-efficient, healthy, and durable”. These policies and guidelines are implemented in the *Marin County Development Code* (Title 22 of the *Marin County Code*), where sections of the code require development projects conserve energy and protect natural resources. A particular example is Chapter 22.42 - Design Review, which contains a number of sections that require energy efficiency measures in new development. The County’s Green Building Residential Certification Program include requirements that are a point based system that range from a silver rating for homes between 2,501 and 4,000 square feet to a platinum rating for homes over 5,500 square feet. Points are assigned to different portions of home construction requiring a more intense use of energy efficient Green Building practices for larger homes.  

In June 2008 the Marin County Board of Supervisors Adopted Ordinance No. 3492, requiring all new single family dwellings, additions and substantial remodels resulting in a conditioned floor area of 1,500 square feet or greater to exceed the current energy efficiency standards of Title 24 regulations by 15 percent or more. The total amount of conditioned floor area determines the percentage by which a project must exceed Title 24 requirements. Exhibit 5.7-2 lists the requirements of Ordinance No. 3492.

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84 Marin County Building Certification Form, Marin County Community Development Agency, March 10, 2009
Exhibit 5.7-2
Energy Efficiency Compliance Table - Ordinance No. 3492

<table>
<thead>
<tr>
<th>Dwelling Size (Total Conditioned Floor Area)</th>
<th>Buildings Must Exceed Current Title 24 Standards by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500 - 4,499 SF</td>
<td>15.0%</td>
</tr>
<tr>
<td>4,500 - 5,499 SF</td>
<td>17.5%</td>
</tr>
<tr>
<td>5,500 - 6,499 SF</td>
<td>30.0%</td>
</tr>
<tr>
<td>6,500 - 7,499 SF</td>
<td>37.0%</td>
</tr>
<tr>
<td>7,500 - 8,499 SF</td>
<td>43.0%</td>
</tr>
<tr>
<td>8,500 - 9,499 SF</td>
<td>47.5%</td>
</tr>
<tr>
<td>9,500 - 10,499 SF</td>
<td>51.5%</td>
</tr>
<tr>
<td>10,500 - 11,499 SF</td>
<td>55.0%</td>
</tr>
<tr>
<td>11,500 SF and greater</td>
<td>57.5%</td>
</tr>
</tbody>
</table>

Source: Marin County Ordinance No. 3492, Adopted June 3, 2008

The proposed 2008 Easton Point Residential Development includes architectural design guidelines that call for incorporation of sustainable design features, to the greatest extent reasonable, including but not limited to passive solar design; active solar energy; geothermal energy; energy conservation design; and the use of recycled or recyclable building materials. 85

Energy – Significance Criteria

The energy analysis section uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review Guidelines. Based on the State CEQA Guidelines, the project would have a significant energy impact if it would:

- Generated demand for energy services that would result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts, in order to provide acceptable service.

- Generate demand for energy services that would exceed the ability of the service provider to provide service without substantially decreasing its ability to serve the existing population.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant energy impact if it:

- Proposes to utilize energy, oil or natural gas in an inefficient manner.

- Encourages activities that would result in the use of large amounts of energy, oil or natural gas.

• Would exceed the energy supplier’s capacity to supply the project’s energy needs with existing and planned supplies.

• Requires the development of new energy resources.

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**Energy – Impacts and Mitigation Measures**

**Impact 5.7–12 Temporary Increase to Energy Consumption during Construction**

Construction of the proposed subdivision improvements would use electricity and gas, however energy use would not result in the need for new or altered facilities or exceed the capacity of PG&E. This would be a less-than-significant impact.

Construction of the project site would require the use of electricity as well as gasoline and diesel fuels. As discussed in *Chapter 3.0 Description of the Proposed Project* construction of on-site roads and infrastructure would occur in two phases. Construction of each phase would take approximately 12 months (see Exhibit 3.0-12). The estimated construction time for individual houses, which includes time elapsed from the start of site preparation to a finished house with landscaping, would be two years. 86 Energy consumption during construction is temporary in nature and would not create a demand that exceeds PG&E ability to serve the site. It is anticipated that construction contractors would manage the use of energy efficiently to minimize construction costs. For these reasons temporary increases to energy consumption during construction would be a less-than-significant impact.

**Mitigation Measure 5.7-12** No mitigation would be required.

**Impact 5.7–13 Long-Term Energy Impacts**

The 2008 Easton Point Residential Development would not generate a demand for energy services that would result in the need for new facilities, or the physical alteration of existing facilities, or exceed the ability of PG&E to serve the project without substantially decreasing its ability to serve the existing population. This would be a less-than-significant impact.

Assuming the average annual electricity use for residences greater that 2,500 square feet is 10,079 kWh 87 the project would produce a demand of approximately 433,397 kWh per year. PG&E does not anticipate any problems serving the proposed project. 88 As stated above the proposed 2008 Easton Point Residential Development Project includes design guidelines that call for energy conserving features that include the use of passive solar design, active solar energy, geothermal energy, and recycled or recyclable building materials. The project would also be required to comply with *Marin County Ordinance No. 3492*, which requires residences over 1,500 square feet to exceed Title 24 energy efficiency requirements by at least 15 percent. The proposed 2008 Easton Point Residential Development Precise Development Plan calls out maximum house sizes that range from 5,500 to

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88 Nichols • Berman communication with Mindy Rayburn, Senior New Business Representative, PG&E, April 2009.
5.7 Public Services and Utilities

8,750 square feet. Based on the compliance table for Marin County Ordinance No. 3492 (see Exhibit 5.7-2) the residences in the proposed project would need to exceed Title 24 energy efficiency requirements by 30 to 47.5 percent. Based on the anticipated energy consumption and energy efficiency requirements the projects effect on energy service and facilities would be less-than-significant.

**Mitigation Measure 5.7-13** No mitigation would be required.

**Impact 5.7–14 Cumulative Energy Impacts**

Completion of the proposed project, along with the buildout projected by the Town of Tiburon General Plan and the Marin Countywide Plan would increase the demand for energy countywide. This increase in demand would not exceed the capacity of PG&E’s electricity and gas systems or substantially impair PG&E’s ability to provide these services. This would be a less-than-significant cumulative impact.

Both short-term and long-term cumulative development is expected to result in an increase in the demand for energy throughout the County and the Tiburon Peninsula (see Section 3.3 Cumulative Development Assumptions for a description of cumulative development assumptions). It is anticipated that local energy sources would be adequate to serve the increased demands resulting from cumulative development in the area. In 2007 residential uses in Marin County consumed 701 million kWh of electricity. It is estimated the proposed project would consume approximately 433,397 kWh of electricity per year, which is a relatively small portion of the annual amount of electricity consumed by residential uses in Marin County. Therefore the amount energy consumed by this project, and other development projects in the area, would be relatively insignificant when compared to the local area and the region.

In the Marin Countywide Plan, the County proposes a goal of reducing total electricity consumption by 20 percent by the year 2015. Future residential developments would be required to comply with Ordinance No. 3492 which requires developers exceed the Title 24 energy efficiency regulations by an amount determined by the size of the residence. Given the relatively small size of the project, its contribution to long-term cumulative demands on energy resources and services would be negligible and would represent a less-than-significant cumulative impact.

**Mitigation Measure 5.7-14** No mitigation would be required

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**Public Schools – Environmental Setting**

The project site is located in the Reed Union School District (RUSD) and Tamalpais Union High School District (TUHSD).

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89 Easton Point Precise Development Plan Project Narrative (Revision 2), CSW Stuber-Stoeh, April 2009, page 14.

90 Marin County Ordinance No. 3492, Marin County Board of Supervisors, Adopted June 3, 2008, page 3 - Compliance Table.

91 Nichols • Berman communication with Mindy Rayburn, op. cit.
Reed Union School District  The RUSD includes Belvedere, Tiburon, Angel Island, east Corte Madera, and parts of unincorporated areas, including Paradise Cay. The western District boundary is near Blackfield Drive. The RUSD operates three schools: 92

- Reed School (grades K-2) has a capacity of 460 students. Enrollment for the 2009-2010 school year is 456 students, leaving a capacity of 4.

- Bel Aire School (grades 3-5) has a capacity of 600 students. Enrollment for the 2009-2010 school year is 408 students, leaving a capacity of 192 students.

- Del Mar School (grades 6-8) has a capacity of 504 students. Enrollment for the 2009-2010 school year is 382 students, leaving a capacity of 122 students.

Tamalpais Union High School District  The TUHSD extends from the Golden Gate Bridge to the San Rafael City boundary. The TUHSD operates five grade 9-12 schools -- three comprehensive schools (Redwood, Sir Francis Drake, and Tamalpais) and two alternative schools (San Andreas and Tamiscal). Redwood High School would serve the project site.

The TUHSD projects enrollment at each high school based on an average of the continuation of enrollment from students in lower grades. This method generally has proven to be accurate within one to three percent of actual enrollment over the past nine years. Enrollment for the 2009-2010 school year is approximately 1,443 students. Class sizes vary in the different grades. Based on the TUHSD’s enrollment projections enrollment numbers will rise and fall annually over the next five years. The projected enrollment at Redwood High School during the 2014-2015 school year is 1,660 students. According to district staff the three district high schools do not have established capacity limits. District staff is concerned with increasing enrollment. However staff anticipates that certain factors will allow some flexibility to service more students. These factors include an open enrollment policy that permits students to attend any high school in the District, thus distributing the enrollment among the various high schools during peak years. Additionally, teachers at Redwood High School do not currently share classrooms. Per conversations with district staff, each teacher has two prep periods that could potentially provide time for a different class to utilize the classroom. 93

In March 2001 the TUHSD passed a school modernization bond issue. Revenue from this bond sale has been used for modernization of various facilities at Redwood High School, including the construction of two new science classrooms (which are now in use) and other infrastructure improvements. Another bond issue passed in June 2006 allowed additional modernization, including more infrastructure improvements, an auxiliary gymnasium to be constructed east of the existing gymnasium, and replacement of the existing swimming pool with a new 40-meter-by-25-yard pool with a pool house and restrooms. These renovations have recently been completed.

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92 Enrollment information: Nichols • Berman communication with Brenda Lavigne, Office Secretary, Reed Union School District, February 26, 2009.

Public Schools – Significance Criteria

The public schools analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review Guidelines. Based on the State CEQA Guidelines, the project would have a significant impact on schools if it would:

- Result in adverse physical impacts associated with the provision of new or physically altered school facilities or the need for new or physically altered schools facilities, the construction of which could cause significant environmental impacts.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant impact on schools if it would:

- Require additional school capacity or facilities?

Public Schools – Impacts and Mitigation Measures

Impact 5.7-15 Reed Union School District

Project implementation would generate approximately 21 students who would attend Reed Union School District schools. This would be a less-than-significant impact.

The RUSD uses a generation rate of 0.5 student for new single-family housing units which would result in 21 new students from the project site upon buildout. 94 These 21 students would be distributed among grades K-8, but the number per grade during any given year is not known and cannot be estimated. All three district schools (Reed, Bel Aire, and Del Mar) have adequate residual capacity to accommodate project-generated students, because RUSD has sufficient capacity, the project’s potential impact is considered to be less-than-significant.

Mitigation Measure 5.7-15 No mitigation would be required.

Impact 5.7-16 Tamalpais Union High School District

Project implementation would generate about eight to 17 students who would attend Redwood High School. This would be a less-than-significant impact.

The TUHSD has no specific generation rate to estimate the number of students added by new development. Instead, the District projects enrollment based on actual enrollment in the feeder schools. Assuming, for purposes of this analysis, a generation rate of 0.2 to 0.4 high school students for new single-family housing units would result in eight to 17 new high school students. 95 There would be sufficient capacity at the high schools to accommodate this potential increase. Therefore, the project would not result in a significant impact on the TUHSD.

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94 The generation rate for multi-family units is much lower (0.065 student per unit).

Mitigation Measure 5.7-16  No mitigation would be required.

Impact 5.7-17  Cumulative Public School Impacts

Both the Reed Union School District and the Tamalpais Union High School District would have adequate capacity to accommodate future students due to cumulative development. This would be a less-than-significant cumulative impact.

Development on the project site together with cumulative development in the Tiburon Planning Area would result in an increase in students and demands on both the RUSD and the TUHSD. The 435 housing units included in the cumulative development total would generate approximately 171 students, based on the RUSD student generation rates. 96 Assuming a 0.2 to 0.4 high school student per housing unit the 435 housing units would generate 87 to 174 students.

The increased number of elementary school students could cause overcrowding in the RUSD schools, especially for grades K-3 where there is a maximum of 20 students allowed per classroom; one additional student requires that there be a new classroom. The impact would depend on the time period during which the students attend RUSD schools and the distribution of students through the grade levels. Although each school site has adequate classroom space to house additional students, the additional students may have a detrimental impact on the enrichment programs offered at each site; many of the rooms used for the enrichment programs would have to be returned to core classroom use to accommodate student growth.

Redwood High School would have capacity for the additional students since the TUHSD expects a steady rise in enrollment up to 1,550 students in the 2013 and 2014 school year that could be accommodated by the open enrollment program and sharing classroom space when possible with the schedule of instructors prep periods.

Mitigation Measure 5.7-17  No mitigation would be required.

Solid Waste – Environmental Setting

The Marin County Hazardous and Solid Waste Management Authority has jurisdiction over the solid waste disposal sites, solid waste transformation facilities, transfer and processing stations, and materials recovery facilities within Marin County. Statistical information for solid waste diversion and disposal is available for viewing on the California Integrated Waste Management Boards website. In 2008 the overall waste disposal amount for the Marin County Hazardous and Solid Waste Management Authority was 210,850 tons. 97 Household disposal accounts for 54 percent of the overall waste flow.

The California Integrated Waste Management Act of 1989 (AB 939) required Cities and Counties to meet waste diversion mandates that included diversion of 25 percent of solid waste by January 1995

96 328 single-family units times 0.5 student per units = 164 students plus 107 multi-family and second units times 0.065 student per unit = 7 students.

and 50 percent diversion by January 2000. As shown in Exhibit 5.7-3 the Marin County Hazardous and Solid Waste Management Authority has exceeded AB 939’s diversion requirements.

**Exhibit 5.7-3**  
*Marin County Hazardous and Solid Waste Management Authority Diversion Rates 1995 - 2006*

<table>
<thead>
<tr>
<th>Year</th>
<th>Diversion Rate (percentage)</th>
<th>Year</th>
<th>Diversion Rate (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>32</td>
<td>2001</td>
<td>73</td>
</tr>
<tr>
<td>1996</td>
<td>41</td>
<td>2002</td>
<td>71</td>
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<td>1997</td>
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<td>2003</td>
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<td>1998</td>
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<td>58</td>
<td>2005</td>
<td>75</td>
</tr>
<tr>
<td>2000</td>
<td>71</td>
<td>2006</td>
<td>72</td>
</tr>
</tbody>
</table>


Mill Valley Refuse Service, a private company under contract to provide solid waste disposal services, would provide waste collection service to the project site. Solid waste collected at the project would be disposed at the Redwood Landfill, located just north of Novato. Based on the remaining capacity currently permitted at the Redwood Landfill, it is projected to have adequate capacity at least through 2024. 99 In December 2008, following extensive environmental review, the Marin County Environmental Health Services issued a revised Solid Waste Facility Permit that allowed for an increase of total capacity from 19.1 million cubic yards (mcy) to approximately 26 mcy. However the projected closure date remained July 2024.

**Solid Waste – Significance Criteria**

The solid waste analysis uses criteria from the *State CEQA Guidelines* and the Marin County Environmental Impact Review Guidelines. Based on the *State CEQA Guidelines*, the project would have a significant impact on solid waste facilities if it would:

- Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs.

- Not comply with federal, state, and local statutes and regulations related to solid waste.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant impact on solid waste facilities if:

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98 Diversion rates for 2007 and later years were not available on 2/15/2010

• A landfill is not available with sufficient capacity to accommodate the proposed project?

Solid Waste – Impacts and Mitigation Measures

NO OR LESS-THAN-SIGNIFICANT IMPACTS

Based on the findings of the analyses completed as a part of this EIR it has been determined that the proposed 2008 Easton Point Residential Development would have no or less-than-significant impacts for the following significance criteria:

• Not comply with federal, state, and local statutes and regulations related to solid waste.

All applicable federal, state, and local regulations related to solid waste would be complied with as part of the proposed project.

IMPACT ANALYSIS

Impact 5.7-18 Project and Cumulative Increase Demand for Solid Waste Services

Project implementation would result in an increased demand for disposal of solid waste. This would be a less-than-significant impact.

The 43 additional houses on the project site would house approximately 97 people. Based on California Integrated Waste Management Board estimates, the 97 residents would generate approximately 263 pounds per day. Cumulative development in the Tiburon Planning Area would generate an increased solid waste disposal demand.

Marin County’s Integrated Waste Management Plan indicates that the Redwood Landfill will have adequate capacity beyond 15 years and into the foreseeable future. Based on the available capacity it has been projected that Marin County can provide at least 15 years of permitted disposal capacity for all jurisdictions within the County. Furthermore, as shown above in Exhibit 5.7-3, Marin County has exceeded the mandatory diversion rates established by AB 939. The county has adopted a zero waste initiative with goals to reduce waste by 80 percent in the next five years and zero disposal by 2025. The county is currently pursuing implementation of policies and programs that would reduce the creation of waste up-stream through public education to promote reduced consumption and


102 Marin Countywide Plan Update Draft EIR, Nichols • Berman and Marin Community Development Agency, January 2007, page 4.10-34.

policies to promote responsibility in the production end, as well as programs to reduce waste downstream by increases the types of materials collected by haulers and extending recycling services. 104

With consideration for Marin County’s ability to exceed waste diversion mandates, and plans to implement policies and programs to pursue a goal of zero waste by the year 2025, it is anticipated that waste generation from cumulative development would have a less-than-significant impact on solid waste disposal.

**Mitigation Measure 5.7-18** No mitigation would be required.

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**Parks and Recreation Facilities – Environmental Setting**

The Marin County Department of Parks and Open Space manages 28 parks with 800 acres of parkland and 925 acres of conservation land. 105 The Marin County Open Space District (MCOSD), a division of the Marin County Department of Parks and Open Space, operates 34 open space preserves with over 15,508 acres of open space. 106 The *Marin Countywide Plan* identifies 932 acres of development parkland, including city owned parks that are used for active recreation. 107

The *2008 Easton Point Residential Development* does not include development of a new park. The project does propose to dedicate 59.92 acres of open space (Parcels A and B) to the MCOSD. Existing park and open space areas located near the project site include Paradise Beach County Park, Tiburon Uplands Nature Preserve, Old St. Hilary’s Open Space Preserve, Angel Island State Park, and the Richardson Bay Lineal Park. Both the Tiburon Uplands Nature Preserve and Old St. Hilary’s Open Space Preserve are adjacent to the project site. **Exhibit 5.7-4** contains a list of parks and open space that are local to the proposed project site.

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105 Marin County Parks and Open Space Department Comprehensive Strategic Plan: Existing Conditions Needs and Assessment Report, PMC, June 2007, pages 4-2.

106 Ibid., pages 4-2 and 4-30.

Exhibit 5.7-4
Parks and Open Space Local to Project Site

<table>
<thead>
<tr>
<th>Park</th>
<th>Size (Acres)</th>
<th>Amenities</th>
<th>Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradise Beach</td>
<td>19</td>
<td>Beach, fishing pier, lawn area with picnic tables, horse shoe court</td>
<td>Marin County</td>
</tr>
<tr>
<td>Tiburon Uplands Preserve</td>
<td>24</td>
<td>Scenic loop trail, species preservation</td>
<td>Marin County</td>
</tr>
<tr>
<td>Old Saint Hilary’s Open Space Preserve</td>
<td>117</td>
<td>St. Hilary’s Church and historic botanical gardens. Rare species located on preserve.</td>
<td>Marin County</td>
</tr>
<tr>
<td>Richardson Bay Lineal Park</td>
<td>47.2</td>
<td>Blackie’s Pasture, McKegney Green, South of Knoll</td>
<td>Town of Tiburon</td>
</tr>
<tr>
<td>Shoreline Park</td>
<td>2.4</td>
<td>Developed turf area, located near Elephant Rock.</td>
<td>Town of Tiburon</td>
</tr>
<tr>
<td>Angel Island State Park</td>
<td>740</td>
<td>Ferry access, camping, hiking, boating, historic landmarks.</td>
<td>State of California</td>
</tr>
</tbody>
</table>

Sources: Marin Countywide Plan, Tiburon General Plan, Marin County Open Space District, and California State Parks

In a recent community survey Paradise Beach County Park and the Tiburon Uplands Nature Preserve, both located on the Tiburon Peninsula, were identified among the six most popular recreational areas within the County’s park system.  

Acquisition of adequate amounts of parkland is enforced by the Quimby Act. The Quimby Act requires that local jurisdictions pass an ordinance that requires developers to dedicate a minimum of three acres of parkland or conservation easements for every 1,000 residents. Marin County complies with the Quimby Act by requiring parkland dedication or payment of an in-lieu fee at the time of a Tentative Map approval for a project.

The Marin Countywide Plan requires between three and five acres of neighborhood and community parkland for every 1,000 county residents. Marin County is also trying to achieve National Park Association requirements of 10 acres of parkland per 1,000 residents.

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108 Marin County Parks and Open Space Department Comprehensive Strategic Plan: Existing Conditions Needs and Assessment Report, PMC, June 2007, page 4-2.

109 California Government Code Section 66477 (Quimby Act), California State Legislature.

110 Marin County Development Code Section 22.98.040 Parkland Dedication and Fees, Marin County Board of Supervisors, adopted 2003.

111 Marin Countywide Plan, Marin County CDA, November 6, 2007.
Parks and Recreation Facilities – Significance Criteria

The Parks and Recreation Facilities analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review Guidelines. Based on the State CEQA Guidelines, the project would have a significant impact on parks and recreation facilities if it would:

- Result in substantial adverse physical impact associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for parks.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant impact on parks and recreation facilities if:

- Require designation of additional parkland to remain in conformance with locally acceptable or adopted park standards?

Parks and Recreation Facilities – Impacts and Mitigation Measures

NO OR LESS-THAN-SIGNIFICANT IMPACTS

Based on the findings of the analyses completed as a part of this EIR it has been determined that the proposed 2008 Easton Point Residential Development would have no or less-than-significant impacts for the following significance criteria:

- Require designation of additional parkland to remain in conformance with locally acceptable or adopted park standards?

A residential subdivision of this nature, with large lots and adjacent open space, would not result in a deficiency of recreational activities, or require designation of additional parkland to remain in conformance with locally acceptable or adopted park standards. The project proposes 43 units which, in accordance with Marin County Code Section 22.98.040[G], would require payment of fees in lieu of parkland dedication to satisfy local standards. The project’s contribution to cumulative increased demand on parkland is analyzed with Impact 5.7-21 Cumulative Impacts on Existing Parks and Open Space.
Impact 5.7-19 Open Space Impacts

Several aspects of the proposed project may result in impacts related to pedestrian access, special status plants, and visual impacts on the existing open space owned by Marin County—both Old St. Hilary’s Open Space Preserve and Tiburon Uplands Preserve. Dedication of Parcel A and Parcel B as public open space would increase the land management burden for the Marin County Open Space District, or another public land management agency, by increasing demands for management of Parcels A and B and constraining the land management agency’s ability to manage existing open space. This would be a significant impact.

Several aspects of the proposed project may impact the existing open space owned by Marin County—both Old St. Hilary’s Open Space Preserve and Tiburon Uplands Nature Preserve. These impacts are discussed in other sections of the Draft EIR and summarized below.

PEDESTRIAN ACCESS

As discussed in Chapter 3.0 Description of the Proposed Project parts of the site boundaries are fenced and posted with “no trespassing” signs. There are, however, informal paths on the project site. For example, an informal hiking path is located in the southwestern portion of the project site. The path begins where Ridge Road currently terminates, and generally heads north to connect with Old St. Hilary’s Open Space Preserve. This informal path provides pedestrian access from the Hill Haven neighborhood to Old St. Hilary’s Open Space Preserve.

Old St. Hilary’s Open Space Preserve is 117 acres and extends from just north of downtown Tiburon uphill to the southern boundary of the Tiburon Uplands Nature Preserve, another open space preserve that is managed by Marin County. Old St. Hilary’s Open Space Preserve features steep hills that limit the ability for interior trails to access the entire site. Therefore, public accessibility is dependent on multiple access points around the perimeter of the area. Vistazo Fire Road provides a trail through the lower portion of the open space preserve. The Heathcliff and Lyford fire roads provide trails through the upper portion of the open space preserve. There are no trails that connect these fire roads.

The 2008 Easton Point Residential Development proposes a vehicle and circulation plan that would preserve public access from the Hill Haven neighborhood to Old St. Hilary’s Open Space Preserve. As proposed a 40 foot wide public access easement would be located along Ridge Road, and a 30 foot wide public access easement would be located along Mt. Tiburon Court. A public access easement of variable width would connect Mt. Tiburon Court to the open space. As proposed the 2008 Easton Point Residential Development would establish a legal public access route that connects the Old St. Hilary’s Open Space Preserve to the existing Hill Haven residential area.

Impact 5.1-7 Project Impact on Pedestrian Circulation discusses the proposed public access to Old St. Hilary’s Open Space Preserve and the Tiburon Uplands Preserve and states that as proposed the project would not provide adequate public access. This is identified as a significant impact.

Mitigation Measure 5.1-7 requires measures that will enhance pedestrian access to adjacent open space. These include the requirement to provide sidewalks on one side of each proposed road, a public pathway connecting Mt. Tiburon Court to Old St. Hilary’s Open Space Preserve, and the provision of all-weather surface pathways consistent with the Marin Countywide Plan trail plan.
**SPECIAL STATUS PLANTS**

As discussed in Section 5.6 Biological Resources two special status plant species have been confirmed to be present within the serpentine bunchgrass habitat of the project site, the Marin dwarf flax and serpentine reed grass. The population of Marin dwarf flax on the project site is part of a larger population that continues west of the site onto the Old St. Hilary’s Open Space Preserve. Additionally, three other special status plant species occur within 100 feet of the western boundary of the project site on the Old St. Hilary’s Open Space Preserve: the Tiburon Indian paintbrush, Tiburon jewel-flower, and Charlott Hall’s lace fern. Impact 5.6-1 Impact to Special Status Plants discusses the impact to the Marin dwarf flax. In addition Impact 5.6-1 states that development on Lot 1 could result in indirect impacts to the three special status plant species occurring on the Old St. Hilary’s Open Space Preserve. Mitigation Measure 5.6-1 includes measures to avoid or reduce impacts to special status plants. These measures require the redesign of the PDP site plan to preserve on-site populations of Marin dwarf flax and serpentine reed grass within Parcel A or Parcel B. Mitigation Measure 5.6-1 would result in the avoidance of indirect impacts to special status plants occurring downslope on Old St. Hilary’s Open Space Preserve.

**VISUAL QUALITY**

As discussed in Section 5.8 Visual Quality the project site is highly visible from Old St. Hilary’s Open Space Preserve. As discussed in Impact 5.8-1 View from Tiburon Ridge development on the project site would be highly visible from the Old St. Hilary’s Open Space Preserve. From some places in the open space preserve, houses on lots at the higher elevations on Ridgeline C would either partially or completely block the view of San Francisco Bay, the City of San Francisco, and the Golden Gate Bridge. This would be especially true in views from the trail that runs parallel to the fence line between the open space and the project site. Parts of the proposed development would be in view from much of the open space. Mitigation Measure 5.8-1 includes specific measures to reduce the visual impact of the proposed project.

**OPEN SPACE MANAGEMENT**

The applicant is offering two open space parcels (Parcel A 59.6 acres and Parcel B 0.33 acres) for dedication to the MCOSD. Dedication of Parcel A and Parcel B as public open space would increase management and maintenance responsibilities for the MCOSD. Parcels A and B contain several maintenance issues related to landslides, hydrology, special-status plants, public access, and vegetation management. Improvements to open space areas would likely include pedestrian bridges, culverts, gates, and signs as necessary to support the management of natural resources and public use of the open space. The upkeep of parcels A and B may constrain the MCOSD’s ability to manage other open space lands for which it is responsible.

**Mitigation Measure 5.7-19** The following measures would be required to reduce the project’s open space impacts.

**Mitigation Measure 5.7-19(a)** Mitigation Measures 5.1-7, 5.6-1 and 5.8-1 would be required to mitigate project impacts to the adjacent Marin County Open Space District’s open space.

Mitigation Measure 5.1-7 would require improvements to pedestrian circulation. This would include paved shoulders along Paradise Drive, on-site sidewalks consistent with MCC sections 24.04.440(b) and (c) and all-weather surface pathways consistent with the CWP trail plan.
Mitigation Measure 5.6-1 would require measures to avoid impacts to special-status plants.

Mitigation Measure 5.8-1 would include measures to reduce the visual impact of the proposed project as viewed from Tiburon Ridge in the Old St. Hilary’s Open Space Preserve.

**Mitigation Measure 5.7-19(b)** Develop and implement an Open Space Management Plan for parcels A and B. At a minimum the Open Space Management Plan shall include the following elements:

- A description of the maintenance and management methods for the upkeep of the open space.
- Collusion with the mandatory requirements for sensitive habitats Resource Management Plan required in Mitigation Measure 5.6-1.
- Determine a mechanism by which the Open Space Management Plan shall be funded in perpetuity in consultation with Marin County and the MCOSD. Such a mechanism would be the establishment by the applicant of a non-wasting endowment, funded by the applicant and / or through monthly POA fees.

**Significance after Mitigation**

**Mitigation Measure 5.7-19(a)** As discussed for the respective mitigation measures, Mitigation Measures 5.1-7 would reduce impacts to trails to a less-than-significant level. Mitigation Measure 5.6-1 may not reduce impacts to special status species on Old St. Hilary’s Open Space Preserve. Mitigation Measure 5.8-1 would not reduce the impact to views from Old St. Hilary’s open space to a less-than-significant level. Therefore the proposed project would have a significant unavoidable impact to the existing views for the adjacent Marin County open space lands, and may have a significant unavoidable impact on the special status plant species population on the Old St. Hilary’s Open Space Preserve.

**Mitigation Measure 5.7-19(b)** Implementation of the Open Space Management Plan would reduce impacts to the MCOSD for management of the open space lands to a less-than-significant impact.

**Responsibility and Monitoring** For Mitigation Measure 5.7-19(a) the responsibility and monitoring would be the same as for Mitigation Measures 5.1-7, 5.6-1 and 5.8-1.

For mitigation measure 5.7-19(b) the applicant would be responsible to develop and implement the Open Space Management Plan, until such time that the open space lands are dedicated to the MCOSD or other approved entity. Upon dedication that entity would take over implementation of the Open Space Management Plan. The applicant and / or the POA would be responsible for funding the Open Space Management Plan.
Impact 5.7-20  Increased Demand on Existing Parks and Open Space.

Accelerated deterioration of public parks and open space, resulting from increased demand / use, could cause significant environmental impacts in maintaining acceptable service ratios for park, recreational, and open space facilities. This would be a less-than-significant impact.

It is assumed that the average household size in Marin County is 2.3 people. Based on this assumption the proposed project would house approximately 99 people. The Marin Countywide Plan (CWP) suggests three to five acres per 1,000 people to meet Quimby Act standards, and also suggests ten acres per 1,000 residents to meet National Park Association Standards. Marin County Code Section 22.98.040 requires new subdivisions to dedicate parkland or payment of an in-lieu fee. The requirement is in compliance with the Quimby Act. The formula for land dedication is 0.003 acres per person multiplied by the average number of persons per household. An in-lieu fee is based upon fair market value of land otherwise required for dedication plus 20 percent of the fair market value to cover the cost of off-site improvements that would otherwise be required with the dedication of parkland.

The Socio-Economic Element of the CWP contains park acreage for each of the planning areas located within the county. According to the CWP the county’s inventory of developed park acreage is 932 acres, which is 304 acres short of Quimby Act requirements, and 1,541 acres short of the National Parks Association standards. Therefore, throughout the county, there is currently a deficient amount of parkland that falls short of Quimby Act requirements and the desired goal of meeting national standards. The proposed project site is located within the Richardson Bay Planning Area, which encompasses the Tiburon Peninsula and all other lands southeast of Mount Tamalpais, south of Corte Madera Ridge, and north of Fort Baker. According to the CWP the Richardson Bay Planning Area has 262 acres of developed park acreage, which exceeds the Quimby Act requirement by two acres, and is 285 acres short of the National Park Association standards.

Considering the availability of developed park acreage located in the Richardson Bay Planning Area, particularly sites that are located in close proximity to the proposed project site (see Exhibit 5.7-4), the 99 additional residents would have a minimal impact on existing park facilities. Assuming that all residents of the proposed project would be new to Marin County, the increase of 99 residents would happen over time, and would not be a substantial increase in relation to the existing population. Furthermore development of this nature, with large lots and adjacent open space, do not typically present a high demand for external recreational opportunities, especially in comparison to higher density small lot developments. Therefore, the 2008 Easton Point Residential Development would have a less-than significant impact on existing parks and open space.

Mitigation Measure 5.7-20  No mitigation would be required

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112  Marin Countywide Plan, Marin County CDA, November 2007, page 3-34.

113  Ibid, page 4-142

114  Ibid, page 4-143, Figure 4-41.

115  The CWP defines “developed park acreage” as developed for the purpose of active recreation, including city-owned parks.

116  Marin Countywide Plan, op. cit., page 3-236.
Impact 5.7-21  Cumulative Impacts on Existing Parks and Open Space

Development of the proposed 2008 Easton Point Residential Development along with other development along the Tiburon Peninsula could result in significant cumulative impacts on existing parks and open space. This would be a less-than-significant cumulative impact.

The proposed project along with cumulative development in the area would increase demand on existing parks and open space and contribute to the deterioration of such facilities from increased use. Given the variety of parks, open space, and other recreational activities in the area, and the fact the development proposed large lots with nearby open space, it is anticipated the projects contribution to cumulative impacts on parks and open space would be minimal. Individual projects would be required to meet parkland dedication requirements and / or meet Quimby Act requirements. Therefore the project would have a less than cumulatively considerable contribution.

Mitigation Measure 5.7-21  No mitigation would be required
5.8 VISUAL QUALITY
5.8 VISUAL QUALITY

Visual Quality – Introduction

INTRODUCTION

This section examines potential changes that could harm the visual and aesthetic quality of the project site and vicinity as a result of development of the 2008 Easton Point Residential Development project. The analysis uses, in part, photographs of existing conditions and photo simulations of the proposed project to show “before” and “after” representations of four views of the project site. The methodology used to evaluate visual changes resulting from site development is discussed below, followed by descriptions and analyses of the four views selected for evaluation in this EIR.

Public scoping comments received by Marin County in February 2009 regarding the project’s impacts to visual quality include visual impacts resulting from construction of the project including fencing, retaining walls, roads, and home construction on or near ridgelines. Impacts to inboard and outboard views should be analyzed and simulations from multiple vantage points should be prepared. Also, concerns were raised regarding visual impacts resulting from construction of the new water tank as proposed.

VISUAL QUALITY METHODOLOGY

The methodology used in this EIR was developed by combining and refining visual assessment techniques originally formulated by government resource agencies for their large-scale land use and management projects. The methodology was further adjusted to modify specific elements to address the types and scales of project sites and proposed projects normally evaluated in environmental documents prepared pursuant to the California Environmental Quality Act (CEQA). The methodology also was designed to provide an objective basis for determining the significance of visual and aesthetic impacts under CEQA.

Tasks conducted to evaluate visual impacts of the proposed 2008 Easton Point Residential Development project included viewing the site from locations around the project site, selecting representative viewpoints for consideration in the EIR, describing the site from those locations and determining the sensitivity of each view, illustrating the post-project appearance of the site, and determining the degree of impact. These tasks are summarized below.

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1 The organization of this section differs slightly from the other sections in Chapter 5.0 Environmental Setting, Impacts, and Mitigation Measures. Rather than provide the entire setting information in one discrete subsection at the beginning of this section, existing conditions for each viewpoint are described immediately preceding the analysis of each view.

2 The methodology was derived from those originally identified by the Bureau of Land Management (BLM) and U.S. Forest Service (USFS) and modified for CEQA EIR purposes.
**Determine Viewpoints and Future Conditions**

A number of locations provide views to at least part of the 110-acre project site. In total, a large number of people see the site in one manner or another. Because the site occupies the upper reaches of the southeast portion of the Tiburon Peninsula, medium-range views of the site occur from Angel Island, the surface of San Francisco Bay, and places in the city of Belvedere at distances of about one to 1.5 miles. Long-range views of the site are possible from four miles away and greater from places that include the Golden Gate Bridge, the City of San Francisco, the City of Berkeley, the Richmond-San Raphael Bridge, Mill Valley, and Mount Tamalpais. Close-range views of the site occur from places that are adjacent to it, particularly Old St. Hilary’s Open Space Preserve and nearby residential areas. The project site is partly visible for brief periods from points on Paradise Drive. The project site is visible from short segments of some nearby residential streets including Lyford Drive, Heathcliff Drive, Mountain View Drive, Ridge Road and Straits View Drive.

Field studies and photo documentation of the project site and surrounding areas were conducted to develop an inventory of existing visual conditions. Based on the set of photos that were taken, Marin County staff and the EIR consultants selected four viewpoints for use in preparing photo simulations. Viewpoint number 1 is from Tiburon Ridge inside the Old St. Hilary’s Open Space Preserve, viewpoint number 2 is at the east end of Heathcliff Drive at the edge of the open space preserve, viewpoint number 3 is on Paradise Drive, and viewpoint number 4 is at Ayala Cove on the northwest side of Angel Island. The location of each viewpoint is shown in Exhibit 5.8-1. These points represent the close-range views of the project site available from locations accessible to the public. Exhibits 5.8-4, 5.8-6, 5.8-8, and 5.8-10 show the existing conditions from these viewpoints while Exhibits 5.8-5, 5.8-7, 5.8-9, and 5.8-11 are the corresponding photo simulations that show the bulk, mass, scale, and location of the of the proposed 2008 Easton Point Residential Development project.

**Characterize Views**

This EIR considers two elements that characterize a view, sensitivity and visual dominance, in order to objectively measure the change to the view and determine the significance of project impacts.

**Sensitivity**

The first element is the sensitivity of the view. Sensitivity describes the nature of the landscape cover (e.g., grassland or woodland); prominence of the view (e.g., on a ridge, along a slope, in a valley); surroundings (e.g., developed and undeveloped surrounding uses); and plans and policies governing the use of the land that provide an expectation of development and encourage or discourage certain types of development.

**Visual Dominance**

The second element is the visual dominance of the project, which is a measure of how the form, line, color, and texture of structures added to a view interact with those elements of the surroundings of the project site. These terms are further defined below:

**Form** The shape or structure of something as opposed to the material which composes it. Important sub-elements of form include geometry (i.e., shape of the form), complexity (i.e., simplicity of the form), and orientation.

**Line** The path, real or imagined, the eye follows when perceiving abrupt differences in form, color, or texture. The most common line in the landscape is the edge of shapes or masses. Important sub-
Exhibit 5.8-1
Viewpoint Locations

Source: TOPO! Wildflower Productions (United States Geological Survey), 2001
elements of line include **boldness** (i.e., strength of the line), **complexity** (i.e., simplicity of the line), and **orientation**.

**Color** The property of reflecting light. Color is composed of **hue** (i.e., aspect of color we know by name, such as blue or green), **value** (i.e., degree of darkness from black to white), and **chroma** (i.e., degree of color saturation or grayness, ranging from pure [i.e., high chroma] to dull [i.e., low chroma]).

**Texture** The visual or tactile surface characteristics of something. Texture consists of **grain** (i.e., relative dimensions of surface variation, from fine to coarse), **density** (i.e., spacing of surface variation), and **regularity** (i.e., amount of evenness and randomness).

**Determine Sensitivity Level of Views**

Views of existing conditions exhibit variations in form, line, color, and texture. These elements, as well as the relationship of development to the site, were evaluated in existing views. The sensitivity level of a view is determined based on the nature of the landscape cover, the prominence of the view, the surrounding existing uses, and plans and policies that might permit development and create an expectation of change or might discourage certain types of development that could bring about a negative change.

The **Marin Countywide Plan (CWP)** designates the project site for residential development, thus indicating an expectation of development. As further described in **Chapter 3.0 Description of the Proposed Project** the land use designations for the property are Planned Residential (PR) and Single Family 6 (SR6). A discussion of the maximum number of housing units associated with these designations is contained in **Chapter 3.0 Description of the Proposed Project**. Approximately 70 acres of the project site is also located in the County’s Ridge and Upland Greenbelt Area. The CWP directs that a variety of strategies be used to protect views of Ridge and Upland Greenbelt areas.

This EIR uses sensitivity levels of **low, moderate, high, and maximum**. For each level of sensitivity there is a corresponding level of visual dominance that would be appropriate for a proposed project to exhibit. The sensitivity level for each of the views analyzed in this EIR is discussed in the individual impact section for the specific view. **Exhibit 5.8-2** summarizes the level of visual dominance of a project that would be appropriate for a given sensitivity level.

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**Exhibit 5.8-2**  
**Sensitivity Level and Appropriate Visual Dominance**

<table>
<thead>
<tr>
<th>Sensitivity Level</th>
<th>Level of Dominance</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Dominant</td>
<td>Project dominates the landscape. Project elements are strong in that they stand out against the setting and attract attention away from the surrounding landscape. Form, line, color, and texture can contrast with existing elements.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Co-Dominant</td>
<td>Project co-dominates. Project elements are moderate in that they are prominent within the setting and attract attention equally with other landscape features. Project generally must borrow from naturally established form, line, color, and texture so that visual characteristics are compatible with their surroundings.</td>
</tr>
<tr>
<td>High</td>
<td>Subordinate</td>
<td>Project is visibly subordinate. Element contrasts are weak in that they can be seen but do not attract attention. Project generally must repeat the form, line, color, and texture of its surroundings.</td>
</tr>
<tr>
<td>Maximum</td>
<td>Inevident</td>
<td>Project is generally not visually evident. Element contrasts are not visible or perceived. Project changes in the characteristics of size, amount, intensity, pattern, etc. should not be evident.</td>
</tr>
</tbody>
</table>

Source: Nichols • Berman, 2007.

**Prepare Photo Simulations**

Photo simulations were prepared to illustrate certain aspects of the 2008 Easton Point Residential Development project as seen from the four study viewpoints. Exhibits 5.8-5, 5.8-7, 5.8-9, and 5.8-11 illustrate some of the project features discussed in Section 3.2 Proposed Project. Architectural designs for any of the proposed new homes and site designs for any of the proposed lots have not been developed.

**VISUAL CHANGES CREATED BY THE PROJECT**

*Chapter 3.0 Description of the Proposed Project* presents the aspects of the proposed project defined by the applicant’s Precise Development Plan (PDP). The most relevant visual characteristics of the project are described below, including certain assumptions that were made about the design of the project in order to prepare the photo simulations.

*Architectural Design Concept and Guidelines* - The PDP application includes applicant proposed Architectural and Landscape Design Guidelines (*Design Guidelines*). The *Design Guidelines* would be included in the Conditions, Covenants and Restrictions (CC&Rs) for the lots in the proposed project. The design for the house on each lot would be subject to review and approval by both the

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4 Architectural and Landscape Design Guidelines for Easton Point, Easton Point – Project Narrative, applicant, 2008, Revision 2 in Response to Comments, received by Marin CDA 3-30-2009, Appendix D.
Easton Point Property Owners’ Association and Marin County through its design review process. Some of the proposed Design Guidelines are different from standards and definitions contained in the Marin County Development Code and if adopted would supersede the relevant standards and definitions in the Development Code.

**Residential Lots** - The applicant proposes to create 43 residential lots for development of single family homes (49.61 acres). In addition, two parcels (Parcel A 59.60 acres and Parcel B 0.33 acres) would be offered for dedication to the Marin County Open Space District. A 180,000-gallon concrete water tank would be constructed on Parcel C (0.25 acres). Individual homes would be developed by future owners of residential lots. The 49.61 acres devoted to residential lots would account for 45 percent of the entire site. Individual lots would range in size from 0.55 (Lot 43) to 2.25 acres (Lot 6), for an average size of 1.1 acres per lot.\(^5\) The 43-lot project has a gross density of one housing unit per 2.55 acres considering the entire 110-acre site area; and a net density of one housing unit per 1.15 acres within the 49.61-acre proposed residential development area.

Residential lots are proposed in the following areas:

- Thirty (30) lots contiguous to the Hill Haven neighborhood, with access via Mountain View Drive to proposed Lots 1 through 3 and via Ridge Road to proposed Lots 4 through 20, 24, 35 through 43.

- Three (3) lots on Paradise Drive, with access via a new shared driveway off Paradise Drive to proposed Lots 21 through 23 adjacent to Old Tiburon at the existing Town boundary.

- Ten (10) lots off Paradise Drive near MMWD’s Paradise Water Tank, with access via Forest Glen Court, a new roadway generally following the existing water tank service road alignment, to proposed Lots 25 through 34.

**Building Bulk, Mass, and Scale** - Exhibit 3.0-5 shows the proposed maximum house size and building footprint for each lot. Maximum house size for each lot is defined as all habitable floor area excluding decks, courts, terraces, porches, and any detached structures not designed for or used for sleeping purposes. Maximum lot coverage (footprint) is the total footprint for all building improvements, including but not limited to the house, garage, guest house, storage shed, pool cabana, arbor, and decks that exceed three feet above finished grade.

**Building Heights** - Single-story and two-story houses are proposed. Residential building heights would depend on the lot location. The applicant proposes that homes on lots accessed through Hill Haven neighborhood not exceed a maximum of 25 feet in height, as measured from grade. The majority of the building should not exceed 20 feet from natural grade. Accessory structures should not exceed 15 feet in height above natural grade. On lots accessed from Paradise Drive, two-story homes would be encouraged in order to minimize building footprints. Homes on these lots are proposed to be a maximum of 30 feet in height as measured from natural grade to the top of the highest roof ridge. Accessory structures should not exceed 15 feet above natural grade.

**Grading, Retaining Walls, and Landslide Repair** - It is estimated that site development (roads, utility installation, and landslide stabilization) would generate approximately 7,000 cubic yards of excess cut material. The applicant proposes to store some of these excess materials on the site in the vicinity of Lots 20 and 24. The material would be available for future development on individual lots.

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\(^5\) Residential acreage (49.61 acres) divided by lots (43) = 1.15 acres / lot (1.1 acres, rounded).
The applicant proposes that Lots 20 and/or 24 be the last developed with housing allowing either or both of these lots to be used as staging/storage areas for the materials for individual lot development.

As a part of the on-site road construction it would be necessary to construct several retaining walls. Wall heights and lengths would vary as needed. Downhill walls over 2.5 feet in height may require guardrails or fencing. Individual lot development would likely require construction of retaining walls. Such walls may be a continuation of the road walls.

The project site is mapped as being underlain by 28 landslides (Landslides 1 through 23, 26, 27, 38 through 40). In general, the project’s geotechnical consultant proposes three main methods of mitigation for the site landslides: use of subdrains, pier and grade beams, and debris fences. Section 5.4 Geology and Soils includes a discussion of each of the 28 previously mapped landslides and the proposed methods of mitigation.

**Landscaping** - The location and species of new landscaping would be regulated by the Property Owner’s Association to ensure that existing scenic views would be preserved. On-site landscaping would utilize primarily native plant species. Existing trees and natural vegetation would be retained where possible. Introduced landscaping would include 80 percent California native species tolerant to drought, fire, and frost. Trees and other vegetation endemic to mixed evergreen forest and open grass lands would be encouraged in landscape plans. The use of invasive species would be prohibited. The PDP includes a conceptual landscape plan, consistent with the proposed guidelines. A plant list consistent with the proposed guideline, and a list of prohibited plants, is also provided. In the photo simulations, all landscaping is shown at five to seven years’ maturity.

**Tree Loss** - The application includes an estimate of the number of trees to be removed from each proposed lot. It states that 742 trees would be removed due to individual lot development, Urban Wildlife Interface regulations, and landslide stabilization. The PDP proposes that when trees would be lost, restoration sites within Parcel A be identified during the Design Review for each house. However, as stated in the discussion of Impact 5.6-8 Loss of Ordinance-Size Trees, it would not be feasible to replace all lost trees on site, and would be difficult to find adequate off-site locations for replacement plantings. Proposed mitigation measures include a fee payment requirement in lieu of replacement plantings.

**Water** - The PDP proposes construction of a new 180,000 gallon water tank on a 0.25 acre parcel (Parcel C) adjacent to the Old St. Hilary’s Open Space Preserve (see Exhibit 3.0-8). The proposed tank location is at the highest elevation of the project site, where topography peaks at approximately 580 feet. The applicant proposes to construct an 80 feet wide building pad that maintains the 580 feet base elevation for the water tank. The new tank would be 20 feet tall and 40 feet in diameter. It would connect to the existing 160,000-gallon Hill Haven Water Tank located at the present end of Ridge Road. Retaining walls for the building pad would range from two to 11 feet tall, and would add to the conspicuous appearance of the water tank.

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6 This refers to retaining walls that would be holding up the road with a drop-off from the road to the grade below. The Building Code requires that any wall over 30 inches must have a guard rail or other protective measure to prevent anyone from falling over the wall.

The existing 12-inch water line serving the 1,000,000-gallon Paradise Water Tank would be relocated along the alignment of Forest Glen Court. A new pump station would be constructed at the existing water tank. A structure to house the pump station and ancillary equipment has not been designed. However, the applicant anticipates a structure that is roughly 15 feet by 20 feet with an interior height of 10 feet.  

**Circulation** - Site access would be provided by extensions of some existing streets and construction of new roadways, as follows:

- Mountain View Drive would be extended from the cul-de-sac within the Hill Haven neighborhood as a 16-foot wide driveway to serve proposed Lots 1 through 3.

- Ridge Road would be extended for a distance of about 1,400 feet as a 20-foot wide paved roadway within a 40-foot wide roadway and utility easement and would terminate in a cul-de-sac. It would serve proposed Lots 4 through 6 and 10 through 20 directly and also would serve proposed Lots 7 through 9 indirectly via a 400 foot long shared driveway.

- Mt. Tiburon Court would be a new 20-foot wide paved roadway off of the extension to Ridge Road. It would serve proposed Lot 24 and Lots 35 through 43.

- A new 16-foot wide paved driveway off of Paradise Drive would provide access to proposed Lots 21 through 23. It would narrow to 12-foot wide beyond Lot 21.

- Forest Glen Court would intersect Paradise Drive at the present location of the existing MMWD water tank service road. It would generally follow the alignment of the 25-foot wide service road but would replace it for a distance of about 800 feet. The new roadway would serve Lots 25 through 34. Forest Glen Court would terminate in a cul-de-sac.

- A construction access road would be constructed from the terminus of Forest Glen Court to the terminus of Mount Tiburon Court. The construction access road would be ten feet wide with turnouts and paved with grooved concrete. After construction, it is proposed that this road remain for emergency access only and would be blocked at either end by a barricade gate.

**Significant Ridgelines**

**Exhibit 4.0-1** illustrates the location of ten ridgelines on the project site (Ridgelines A through J). It has been determined that six visually prominent ridgelines occur entirely or in part on the project site. The visually prominent ridgelines are Ridgelines A, C, D, and J plus those portions of Ridgelines E and F that are located within the Ridge and Upland Greenbelt area (see **Exhibit 4.0-1**). This determination was made using criteria developed in consultation with Marin CDA staff based on past applications on other projects. Neither the Marin Countywide Plan nor the Marin Development Code establishes criteria for ‘Visually Prominent’ ridgelines.

**Design Assumptions and Preparation of Photosimulations**

The photo simulations are based on information submitted by the project applicant as a part of the PDP. To represent the proposed project accurately, a three-dimensional Computer Aided Design (3D CAD) model was developed using AutoCAD software and software specifically designed to be used in

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8 Nichols • Berman communication with Michael Tarnoff, Land Development Solutions, April, 2009.
conjunction with AutoCAD. Note that many aspects of the proposed project will not undergo design until some time in the future. Therefore, the photo simulations show only the components of the project which have either been designed or for which reasonable assumptions could be made, such as the house on each lot which is shown as a generic structure at the maximum size listed in the PDP.

The model includes housing units as they are defined in the project application along with roads, retaining walls associated with roads, and conceptual landscaping of building lots. It does not include driveways, retaining walls that may be needed on individual building lots, sidewalks, fences, or other potential improvements such as guest houses, storage sheds, pools and cabanas, arbors, and decks. Further, the simulations do not show cars although the PDP states that each residence would have a minimum of four off-street parking spaces, two of which would be in a garage. These additional site improvements, although not shown in the photo simulations, would contribute to the developed character of the site once the project is built.

Building materials and exterior colors were applied to the model and accurately rendered, duplicating the view angle, distance, lighting conditions, and time of year of the existing conditions photograph. Existing elements visible in the baseline photograph were included in the 3D model and used as control points to register the model to the photographs. The simulations represent the mass, scale, density, and visibility of the project according to the information provided in the project application.

**Determine Significance of Change in Visual Quality**

Views of the project site would be changed by the proposed development. Whether the development adopts the variations in form, line, color, and texture of the existing site and its surroundings or creates new, contrasting conditions determines the level of visual dominance of a project. For example, if the existing view is composed of natural colors or earth tones, a structure could adopt those colors and have a lower visual dominance or could be finished with a completely different and contrasting color which would create a high level of visual dominance. This EIR uses four levels of visual dominance, dominant, co-dominant, subordinate, and in evident, with a different maximum level of visual dominance appropriate to each level of view sensitivity identified above.

The significance of a change to the site’s visual quality as a result of the project can be determined using the matrix in Exhibit 5.8-3. The level of significance is determined by placing the sensitivity level of a view in a matrix with the level of visual dominance the project will have. *The change to the site’s visual quality is considered significant if visual dominance exceeds what is considered appropriate for the view's sensitivity level.*

**Exhibit 5.8-3**

**Significance of Change to Visual Quality Matrix**

<table>
<thead>
<tr>
<th><strong>Sensitivity Level</strong></th>
<th><strong>Visual Dominance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Dominant</strong></td>
</tr>
<tr>
<td>Maximum</td>
<td>Significant</td>
</tr>
<tr>
<td>High</td>
<td>Significant</td>
</tr>
<tr>
<td>Moderate</td>
<td>Significant</td>
</tr>
<tr>
<td>Low</td>
<td>Less-than-Significant</td>
</tr>
</tbody>
</table>

Source: Nichols • Berman, 2007.
Visual Quality – Impact Significance Criteria

The visual quality analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review guidelines. Based on the State CEQA Guidelines the project would have a significant visual quality impact if it:

- Substantially affects a scenic vista;

Substantially damages scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway;

- Substantially degrades the existing visual character or quality of the site and its surroundings; or

- Creates a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant environmental impact if it would:

- Not comply with County goals and policies related to visual quality.

- Significantly alter the existing natural viewsheds, including changes in natural terrain or vegetation.

- Significantly change the visual quality of the region or eliminate substantial visual resources.

- Significantly increase light or glare in the project vicinity.

- Significantly reduce sunlight or introduce shadow in areas used extensively by the public.

While most projects result in some degree of visible change, CEQA provides little guidance about how much change can occur before a significant impact is triggered. Most EIRs rely on two methods to determine what change is significant. The first is conformance with adopted plans and policies, and the second is a visual analysis. Both methods are used in this EIR. Chapter 4.0 Relationship to Public Plans presents the former, and the visual analysis is presented here.
Visual Quality – Setting, Impacts, and Mitigation Measures

INTRODUCTION

The photographs showing existing conditions and the photo simulations of those views are grouped with the respective impact discussions on the following pages. Exhibit 5.8-1 shows the four viewpoint locations.

Impact 5.8-1 View from Tiburon Ridge (Viewpoint No. 1)

Development on the project site would be highly visible from the Old St. Hilary’s Open Space Preserve as illustrated by the Tiburon Ridge viewpoint. Because this is a public recreation area that offers outstanding scenic vistas and is immediately adjacent to the project site, views from the open space have a maximum level of sensitivity. Consequently, development on the project site would need to be in evident in order to avoid causing a significant change in visual quality. However, the project’s appearance would be dominant. In this view, implementation of the project as proposed would not substantially damage scenic resources, but would substantially affect a scenic vista and would substantially degrade the existing visual quality and visual character of the site. This would be a significant visual quality impact.

Setting Exhibit 5.8-4 shows the view looking southwest toward the project site from Viewpoint No. 1 on Tiburon Ridge within the Old St. Hilary’s Open Space Preserve as it presently appears without the proposed development. The view is panoramic, as are others from within the open space. Centered in the foreground is Ridgeline C with rolling grassland slopping downward on either side. The left side of the ridge is characterized by shrubs and grasses while the right side is mainly grassland with only a few shrubs. The site has a distinctly undeveloped character and appears as an extension of the public open space.

The project site comprises the entire foreground of the view from Viewpoint No. 1. San Francisco Bay and parts of the cities of Belvedere and Sausalito form the middle ground. The background of the scene is comprised of the City of San Francisco (in the left portion of the view), the Presidio National Park (center), and the Golden Gate Bridge (right). These elements form a composition of striking scenic quality. The open space character of the project site in the foreground is an important contributor to the attractiveness of the overall scene.

View Sensitivity and Appropriate Visual Dominance The Old St. Hilary’s Open Space Preserve is publicly owned and regularly used by the public. Tiburon Ridge extends into the preserve and the Tiburon Ridge Trail traverses the open space. The open space has elevated points that provide panoramic views of the San Francisco Bay area. People visit the open space, in part, to experience the views which visitors may take in for long durations if they choose. When looking toward the project site, Angel Island, San Francisco Bay, the City of San Francisco, and the Golden Gate Bridge are in view. Considering these factors, the sensitivity level of this view is maximum. To avoid causing a significant change in visual quality in this case, proposed development on the project site would need to be out of view or otherwise in evident from the open space (see Exhibit 5.8-2).

Impacts Exhibit 5.8-5 presents a photo simulation of the site showing proposed development from Viewpoint No. 1 on Tiburon Ridge in the Old St. Hilary’s Open Space Preserve. The photo simulations prepared for the project show the mass, scale, density, and arrangement of conceptual
residential buildings as defined in the PDP. They also include proposed roads, retaining walls along the roads, and conceptual landscaping although in the case of Viewpoint 1, retaining walls along the roads are not in view. They do not show other potential project improvements. Other improvements, if built, would contribute to the developed character of the project site. Houses on at least 20 of the proposed 43 lots appear in the simulated view from Viewpoint No. 1.

The proposed 180,000 gallon water tank would be just outside the simulated view, to the left of the residences shown at the left edge of the photo simulation. The water tank would be at the property line between the open space preserve and the project site. The water tank would be a highly conspicuous feature and would likely obstruct at least part of the view of Angel Island. There are two existing water tanks in the vicinity that have relatively little visual impact from the open space preserve, largely because they are surrounded by mature trees. Using vegetation to reduce the impact of the proposed water tank, however, would not be possible due to the steepness of the slope on which the tank would be built. The alignment of the proposed construction access road would further complicate such efforts.

The elevation of Viewpoint No. 1 is higher than the proposed building lots and affords a view looking down at the site. As a result, many of the proposed houses would be seen against a backdrop of land or other houses in the development; however the rooftop profile of about a half dozen or more of the homes would be seen against the waters of San Francisco Bay. The profile of houses on some lots would be seen against a more distant backdrop of Belvedere. Project elements would stand out against the setting and attract attention away from the surrounding landscape.

From some places in the open space preserve, houses on lots at the higher elevations on Ridgeline C would either partially or completely block the view of San Francisco Bay, the City of San Francisco, and the Golden Gate Bridge. This would be especially true in views from the trail that runs parallel to the fence line between the open space and the project site. Parts of the proposed development would be in view from much of the open space preserve.

The introduction of the new development would alter the visual character of the project site. However, this alteration would be consistent with both the CWP land use designation and zoning designation that designate the project site for residential development. Some of the lots proposed for development would be out of view from the open space or seen from limited areas. Lots 21, 22, 23, and 30 through 34 likely would not be in view, while Lots 25 through 29 would likely be seen only from areas within the open space that are near the fence line between the open space and the project site. Houses on these lots would likely be partially hidden by the tall vegetation that surrounds them.

The exterior colors of the houses shown in the photo simulations were chosen by the EIR preparers based on information contained in the PDP but not specifically proposed by the project applicant. The colors shown are primarily neutral browns and grays that appear sympathetic to the surrounding setting consistent with the Design Guidelines contained in the PDP. The close proximity to Viewpoint No. 1 of homes on Lots 1 through 20, Lot 24, and Lots 35 through 43 would make them highly visible. This would be true of the water tank as well although the tank is not in the simulated view. In this view, the proposed development would meet the visual dominance characteristic definition of dominant as presented in Exhibit 5.8-2. Project elements would attract attention from Viewpoint No. 1 due to their contrast in form, line, and texture with those naturally established in the surrounding setting. The proposed development would compete for the viewer’s attention. Because the proposed

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9 Consistency with CWP goals and policies plus the Marin County Code is discussed in Chapter 4.0 Relationship to Public Plans.
project would appear visually dominant from the open space preserve it would cause a significant change in the visual quality and character of views toward the City of San Francisco, San Francisco Bay, and the Golden Gate Bridge and in some instances would block the view. The change in character of the foreground of these views caused by the proposed project would mar the visual attractiveness of the existing scene for users of the open space. In Viewpoint No. 1, the project would result in a significant visual impact.

**Mitigation Measure 5.8-1** The applicant shall incorporate the following measures as a condition of approval: revise the PDP, the project’s CC&Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project as viewed from the adjacent public open space lands:

- Limit building height to one story with a maximum of 18 feet on lots that would be visible from the Old St. Hilary’s Open Space Preserve in order to minimize view blockage the silhouetting of rooflines as seen from within the open space. A secondary impact of lower building heights would be a larger building footprint or a smaller housing unit.

- Locate buildings on Lot 24 and Lots 35 through 43 as far from the spine of Ridgeline C as possible. Locate buildings on Lots 10 through 19 as far from the spine of Ridgeline D as possible.

- Limit chimney heights and widths to avoid their silhouette being seen against the sky or San Francisco Bay from within the open space.

- Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from views from the open space and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that over-planting with trees in a formerly grassland landscape would itself create a significant, man-induced visual change. Additionally, urban-wildland interface restrictions would limit the proximity of plantings to homes and other structures.

This mitigation measure states that buildings on Lot 24 and Lots 35 through 43 should be located as far from the spine of Ridgeline C as possible. In addition buildings on Lots 10 through 19 should be located as far from the spine of Ridgeline D as possible. Based on the landslide mitigation policy prepared for the proposed project by Miller Pacific Engineering Group all fill buttresses must be within 100 feet of the proposed building site. In order for the proposed buttresses not to be located within the proposed open space (Parcel A) the amount of flexibility of where to locate the homes along the ridges is very limited.

Nevertheless it appears that buildings on Lot 24 and Lots 35 through 38 could feasibly be located further down the slope. These lots are not near any on-site landslides. The nearest landslide, Landslide 2, is proposed for complete repair. However, on Lots 39 through 43 and Lots 10 through 19 either additional buttress fill slope repairs and / or buried pile walls would be required to stabilize the landslides. Lowering the elevations of the buildings on these lots would be feasible, however, it would result in a substantial increase in the depth and size of the buttresses and buried walls that would be necessary to create safe building sites. The surplus grading materials and resulting larger areas of disturbance could also cause secondary impacts.

**Significance after Mitigation** Even with implementation of Mitigation Measure 5.8-1, project elements would be within view from the open space preserve and project contrasts with existing conditions would be evident in a view that has a maximum sensitivity level. As discussed above,
using vegetation to reduce the impact of the proposed water tank would not be feasible due to the steepness of the slope on which the tank would be built. The alignment of the proposed construction access road would further complicate such efforts. Therefore, project implementation would result in a significant unavoidable visual impact.

**Responsibility and Monitoring** The applicant would be responsible for revising CC&Rs or the Design Guidelines to incorporate Mitigation Measure 5.8-1. The Easton Point Property Owners' Association and Design Committee would be responsible for implementing the measures, and Marin County would monitor implementation through design review.
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Exhibit 5.8-4
Existing Conditions at Viewpoint No. 1 - View from Tiburon Ridge

Source: Vallier Design Associates, 2009
Impact 5.8-2  View from Heathcliff Drive (Viewpoint No. 2)

Development on the project site would be highly visible from the end of Heathcliff Drive as illustrated by the Heathcliff Drive viewpoint. Viewpoint No. 2 is at the end of a public street looking across the Old St. Hilary's Open Space Preserve. The view has a maximum level of sensitivity. Therefore, development on the project site would need to be invident in order to avoid causing a significant change in visual quality. However, the proposed project would be a co-dominant feature of the scene. In this view, implementation of the project as proposed would not substantially damage scenic resources but would substantially affect a scenic vista and would substantially degrade the visual quality and visual character of the site. This would be a significant visual quality impact.

Setting Exhibit 5.8-6 shows the view looking southeast toward the project site from Viewpoint No. 2 at the east end of Heathcliff Drive at the edge of the Old St. Hilary’s Open Space Preserve as it presently appears. The project site is in the center portion of the view immediately beyond the fence line at the edge of the open space preserve. Ridgelines C and A form the edge of the portion of the site that is visible from this location. Ridgeline C is seen against the backdrop of Angel Island while Ridgeline A is seen in front of the Hill Haven neighborhood. Ridgelines A and C are significant ridgelines. The rolling grasslands and rock outcrops within the open space preserve make up much of the scene. The upper reaches of the project site in view beyond the fence line appear as an extension of the open space. The upper portion of Angel Island, about two miles away, is seen beyond the project site. Except for a few homes in the Hill Haven neighborhood that are visible through partial screening at the right edge of the photograph, there is no residential development seen in either the foreground or middle ground of this particular view. Except for the background, the scene has an undeveloped, open space character.

View Sensitivity and Appropriate Visual Dominance  Heathcliff Drive is a public street and provides public access to the Old St. Hilary’s Open Space Preserve. The trail at the end of Heathcliff Drive leads to the Tiburon Ridge Trail. The view from the end of the road is representative of views available from adjacent private properties. The view looking toward the project site includes parts of Angel Island, the City of San Francisco, and San Francisco Bay. As a result, this view has a maximum sensitivity level. To avoid causing a significant change in visual quality under these circumstances, proposed development on the project site would need to be out of view or otherwise invident from the open space (see Exhibit 5.8-2).

Impacts Exhibit 5.8-7 presents a photo simulation of the site showing proposed development from Viewpoint No. 2 at the east end of Heathcliff Drive. It shows the location, mass, scale, density, and arrangement of conceptual residential buildings on lots proposed for development in the PDP. Part or all of more than a dozen houses appear in the simulated view from Viewpoint No. 2. Roads and associated retaining walls would not be visible from this location. Also, the proposed 180,000 gallon water tank likely would not be visible. It would instead be hidden by topography. Viewpoint No. 2 is at an elevation roughly equal to the proposed building lots on Ridgeline C although some houses at the left side of the photo simulation would be higher and those in the center of the view would be lower. The rooflines of nearly all of the houses that would be located on Ridgeline C would be seen against the backdrop of Angel Island while a few at the far left edge of the image would be seen against the sky. These houses would replace the line now formed by the top of the ridge as seen from this view.

The introduction of the new development in this view would alter the visual character of the project site although in a manner consistent with both the CWP land use designation and zoning designation that designate the project site for residential development. Some of the lots proposed for development, including Lots 21, 22, 23, and 25 through 34, would be out of view from Viewpoint No. 2. Lots 10 through 19 would likely be out of view as well.
The distance from Viewpoint No. 2 to the closest part of the proposed development is about 0.4 miles. At this distance the proposed development would meet the visual dominance characteristic definition of *co-dominant* as presented in Exhibit 5.8-2. Project elements would be prominent within the setting and attract attention equally with other landscape features. Because the proposed project would appear visually *co-dominant* it would cause a significant change in the visual quality and character of the view from Viewpoint No. 2. The change in character of the view caused by the proposed project would diminish the visual attractiveness of the existing scene. In Viewpoint No. 2, the project would result in a significant visual impact.

*Mitigation Measure 5.8-2* In order to mitigate impacts from this viewpoint, implement Mitigation Measure 5.8-1.

*Significance after Mitigation* Even with implementation of Mitigation Measure 5.8-1, project contrasts with existing conditions would be evident in a view that has a maximum level of sensitivity. Therefore, project implementation would result in a significant unavoidable visual impact.

*Responsibility and Monitoring* Same as for Mitigation Measure 5.8-1.
Exhibit 5.8-6
Existing Conditions at Viewpoint No. 2 - View from Heathcliff Drive

Source: Vallier Design Associates, 2009
Exhibit 5.8-7
Post-Development Conditions at Viewpoint No. 2 - View from Heathcliff Drive

Source: Vallier Design Associates, 2009
Impact 5.8-3  View from Paradise Drive (Viewpoint No. 3)
While most of the proposed homes on the project site would not be visible from Paradise Drive, at least two of the homes would appear on a ridgeline and be seen against the sky. The view from Paradise Drive has a high level of sensitivity. Project elements would need to be visually subordinate in order to avoid causing a significant change in visual quality. From this viewpoint, implementation of the proposed project would not substantially affect a scenic vista and would not substantially damage any scenic resources. However, the homes on the ridge would represent a significant change in visual quality. This would be a significant visual quality impact.

Setting Exhibit 5.8-8 shows the view looking northwest toward the project site from Viewpoint No. 3 on Paradise Drive as it presently appears without the proposed development. The project site occupies the hillside in the center portion of the scene. The east end of Ridgeline D and the western part of Ridgeline E form the skyline. Ridgeline D has been determined to be a significant ridgeline. The site appears as grass-covered hills flanked by mature trees at lower elevations. Some overhead utility lines on wood poles can be seen along Paradise Drive. No other development is depicted in the photograph. The project site on the hillside has the visual character of open space in this view.

View Sensitivity and Dominance Paradise Drive is a public road that is used by both motorists and bicyclists. It is the only public through-road on the east side of the Tiburon Peninsula, connecting with Trestle Glen Boulevard and Tiburon Boulevard to form a ring around the peninsula. Paradise Drive twists its way along the base of the hills as it passes the eastern boundary of the project site. The land slopes sharply upward on the west side of the road where it passes the site. Dense stands of trees occur along the road in many places. Topography and vegetation generally confine views to short distances. Views of the project site from Paradise Drive are few and last only briefly for passing motorists or bicyclists. Viewpoint No. 3 is a location on Paradise Drive where a relatively open view of the site occurs, although it lasts only for a matter of seconds. These factors make the sensitivity of this view high. To avoid causing a significant change in visual quality in this case, the visual dominance of proposed development on the project site would need to be subordinate or inevident (see Exhibits 5.8-2 and 5.8-3).

Impacts Exhibit 5.8-9 presents a photo simulation of the proposed development on the site as it would appear from Viewpoint No. 3 on Paradise Drive. From this viewpoint, new houses would be seen on two of the 43 lots proposed for development. Both would appear on the top of the ridge and to see them, viewers would need to look up the slope. Topography and vegetation would hide some parts of the structures. The distance of the new houses from Viewpoint No. 3 would be roughly 500 feet. The open space character of the site would be at least partially retained since development on only two lots would be evident. However, the homes on these lots would appear to sit on the ridgeline and their silhouette would be seen against the sky.

The proposed development meets the visual dominance characteristic definition of co-dominant as presented in Exhibit 5.8-2. The buildings would be sufficiently exposed to attract attention from Viewpoint No. 3. This would largely be due to contrasts in form and line as the houses would be seen against the sky. Since the sensitivity of the view from Viewpoint 3 is high and the proposed project would appear visually co-dominant, it would cause a significant change in visual quality of the view from Viewpoint No. 3. In Viewpoint No. 3, the project would result in a significant visual impact.

Mitigation Measure 5.8-3 The applicant shall incorporate the following measures as a condition of approval: revise the PDP, the project’s CC&Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project:
• Locate the building on Lot 16 as far down the slope as possible and the building on Lot 15 as far to the northeast and down the slope as possible so that they do not appear to be on the top of Ridgeline D and their silhouette is not seen against the sky.

• Limit chimney heights and widths to avoid their silhouette being seen against the sky.

• Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from views from Paradise Drive and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that over-planting with trees in a formerly grassland landscape would itself create a significant, man-induced visual change. Additionally, urban-wildland interface restrictions would limit the proximity of plantings to homes and other structures.

As discussed for Mitigation Measure 5.8-1, locating buildings on Lots 15 and 16 further down the slope would likely require either additional buttress fill slope repairs and / or buried pile walls to stabilize the landslides. Lowering the elevations of the buildings on these lots would be feasible, however, it would result in a substantial increase in the depth and size of the buttresses and buried walls that would be necessary to create safe building sites. The surplus grading materials and resulting larger areas of disturbance could also cause secondary impacts.

**Significance after Mitigation** With implementation of Mitigation Measure 5.8-3, project contrasts with existing conditions would be reduced to visually subordinate. Implementation of Mitigation Measure 5.8-3 would reduce the change in visual quality to a less-than-significant impact.

**Responsibility and Monitoring** The applicant would be responsible for revising the CC&Rs or the Design Guidelines to incorporate Mitigation Measure 5.8-3. The Easton Point Property Owners' Association and Design Committee would be responsible for implementing the measures, and Marin County would monitor implementation through design review.
Exhibit 5.8-9
Post-Development Conditions at Viewpoint No. 3 - View from Paradise Drive

Source: Vallier Design Associates, 2009
Impact 5.8-4  View from Ayala Cove on Angel Island (Viewpoint No. 4)

Development on the project site would be visible from various locations on Angel Island including Ayala Cove as illustrated by the Ayala Cove viewpoint. The view has a maximum level of sensitivity. Therefore, development on the project site would need to be invident in order to avoid causing a significant change in visual quality. However, the proposed project would be a co-dominant feature of the scene. In this view, implementation of the project as proposed would not substantially damage scenic resources but would substantially affect a scenic vista and would substantially degrade the visual quality and visual character of the site. This would be a significant visual quality impact.

Setting Exhibit 5.8-10 shows the view looking north-northwest toward the project site as it presently appears from Viewpoint No. 4 at Ayala Cove on the northwest side of Angel Island. The project site is in the center portion of the landmass seen across Raccoon Strait. The site occupies the undeveloped, grassy hills and the forested areas at the base of the hills and to their right. Within the boundaries of the project site, Ridgelines C, B, and J form horizon lines while Ridgelines D, E, F are evident on the grassy slope below Ridgeline C. Ridgelines G, H, and I are visible to the right of Ridgeline D but are less distinct. All of Ridgelines A, C, D, and J that occur within the project site and parts of Ridgelines E and F have been determined to be visually prominent ridgelines. The project site makes up a good portion of the Tiburon Peninsula shown in the photograph. The site is a distinct feature of the overall scene due to its undeveloped nature, prominent topography, and its grass-covered uplands and forested lowlands. By contrast, the Town of Tiburon seen immediately to the left of the project site is characterized by heavily developed hillsides.

View Sensitivity and Appropriate Visual Dominance  Angel Island is a California State Park. It is a popular destination that offers a variety of opportunities for recreation, including enjoyment of views that include San Francisco, the Marin Headlands, the Tiburon Peninsula, and more. Ferry service provides access to the island. The Park headquarters and a visitor center are located at Ayala Cove. The view from Ayala Cove has a maximum sensitivity level. To avoid causing a significant change in visual quality under these circumstances, proposed development on the project site would need to be out of view or otherwise invident from Angel Island (see Exhibit 5.8-2).

Impacts Exhibit 5.8-11 presents a photo simulation from Viewpoint No. 4 of the project site showing proposed development. In this view, proposed homes on the upper reaches of the project, including those on Lots 24 and 35 through 43 would appear on the Ridgeline C that forms the horizon. They would be the highest structures in the view and their silhouette would be seen against the sky. Homes on Lots 10 through 19 would appear on Ridgeline D where it descends from the upper ridge and therefore would be a bit lower on the slope. They would be seen against a backdrop of land and other homes in the proposed development. Both ridges are primarily grass covered and therefore fully exposed. Roads that would provide access to the new homes would not be in view from this vantage point. The proposed water tank would appear in a prominent position at the highest point of land on the Tiburon Peninsula seen from Ayala Cove. The hillside where the water tank would be built is fully exposed. The top of the water tank would appear slightly higher than the horizon line formed by the ridge behind it. The proposed construction access road between the existing MMWD water tank and the proposed tank would appear as a prominent line across the grassy hillside punctuated in places by retaining walls where they would be necessary to construct the road. By comparison, the homes on proposed Lots 21 through 23 and Lots 25 through 34 would be visible but would appear low on the hillside and relatively unobtrusive. Lots 25 through 34 would be among tall, dense vegetation. Lots 21 through 23 would be at the edge where tall vegetation and grassland meet.

The introduction of the residential development on the ridgelines, the construction access road, and the water tank on the hillside in this view would alter the visual character of the project site, although in a manner consistent with both the CWP land use designation and zoning designation that designate the
5.8 Visual Quality

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The project site for residential development. Some of the lots proposed for development, including Lots 1 through 4 and Lots 7 through 9, would be out of view from Viewpoint No. 4.

The distance from Viewpoint No. 4 to the closest part of the proposed development is about one mile. At this distance the proposed development would meet the visual dominance characteristic definition of co-dominant as presented in Exhibit 5.8-2. Project elements would be prominent within the setting, particularly those that would appear on the ridgeline and seen against the sky. The project would attract attention equally with other landscape features. Because the proposed project would appear visually co-dominant it would cause a significant change in the visual quality and character of the view from Viewpoint No. 2. The change in character of the view caused by the proposed project would diminish the visual attractiveness of the existing scene. In Viewpoint No. 2, the project would result in a significant visual impact.

Mitigation Measure 5.8-4 The applicant shall incorporate the following measures as a condition of approval: revise the PDP, the project’s CC&Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project:

- Limit building height of homes seen as protruding above the ridgeline and against the sky to one story with a maximum of 18 feet. A secondary impact of lower building heights would be a larger building footprint or a smaller housing unit.

- Locate buildings on Lot 24 and Lots 35 through 43 as far from the spine of the Ridgeline C as possible. Locate buildings on Lots 10 through 19 as far from the spine of the Ridgeline D as possible.

- Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from view and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that over-planting with trees in a formerly grassland landscape would itself create a significant, man-induced visual change. Additionally, urban-wildland interface restrictions would limit the proximity of plantings to homes and other structures.

As discussed for Mitigation Measure 5.8-1, locating buildings on Lots 39 through 43 and 10 through 19 further down the slope would likely require either additional buttress fill slope repairs and / or buried pile walls to stabilize the landslides. Lowering the elevations of the buildings on these lots would be feasible, however, it would result in a substantial increase in the depth and size of the buttresses and buried walls that would be necessary to create safe building sites. The surplus grading materials and resulting larger areas of disturbance could also cause secondary impacts.

Significance after Mitigation Even with implementation of Mitigation Measure 5.8-4, project contrasts with existing conditions would be clearly evident resulting in a significant change in visual quality. Therefore, project implementation would result in a significant unavoidable visual impact.

Responsibility and Monitoring The applicant would be responsible for revising CC&Rs or the Design Guidelines to incorporate Mitigation Measure 5.8-4. The Property Owners’ Association and Design Committee would be responsible for implementing the measures, and Marin County would monitor implementation through Design Review.
Exhibit 5.8-10
Existing Conditions at Viewpoint No. 4 - View from Ayala Cove on Angel Island

Source: Vallier Design Associates, 2009
Exhibit 5.8-11
Post-Development Conditions at Viewpoint No. 4 - View from Ayala Cove on Angel Island

Source: Vallier Design Associates, 2009
Impact 5.8-5 Landslide Repair

Proposed landslide repair on the project site would be accomplished primarily by subsurface methods, but would also employ some above-ground elements. Long-term visual evidence of landslide repair may persist and be recognizable as an unnatural alteration of the hillside. This would be a significant visual quality impact.

Proposed on-site landslide repair is described in Section 5.4 Geology and Soils. In general proposed methods of mitigation for the site landslides include the use of subdrains, pier and grade beams, and debris fences. Exhibit 5.4-4 illustrates the type of landslide repairs the applicant’s geologists propose. In some cases landslide repair would involve excavating, draining, and replacing the soil with compacted material. The artificial fill slopes, as proposed for the proposed buttresses for the landslide repair, would be required by the Uniform Building Code to be at a 2:1 gradient. The slopes would be anticipated to be rather uniform in appearance. Such slopes typically do not look very natural as artificial fill slopes tend to be angular, except along their edges where they could be graded to conform to the adjacent topography. The slopes would be replanted with grasses. Areas of the site that would be treated in this manner are not forested, so few trees would be affected. It would probably be feasible to do some re-grading to make some of the slopes into more natural contours, however, the only way to round and soften the slopes to a more natural appearance, would be to add more fill. This would increase the depth, area, and volume of fill moved. As a result, it is likely that final grading could result in a fairly uniform slope and could have an engineered appearance. This would distinguish the treated areas from undisturbed slopes making it possible to recognize the areas that were stabilized in this manner. The change in appearance would be less noticeable compared to the change created by the proposed homes, roads, etc but would still be a significant visual impact. In other cases, proposed landslide repair would involve installing buried drilled pier and grade beam walls, and subdrains. These would all be subsurface features and, therefore, not visible except for evidence of surface disturbance from construction. Debris flow fences are also proposed. These are made of wire mesh similar to common chain-link fence material. The debris fences would be from six to 12 feet high and long enough to span the area of potential debris flow. They would be installed at five locations near the toe of the slope above Paradise Drive where seasonal drainages meet the road. The fences would be at least 50 feet back from the road and as much as 15 to 40 feet higher than the elevation of the road. It is important, however, that the fences be located as low on the slope as feasible, to catch as much debris as is possible. They would all be in areas that are densely wooded. The fences would likely be visible but would not be in full view due to their setback from the roadside, position on the slope above the road, and screening by vegetation.

Mitigation Measure 5.8-5 The applicant shall incorporate the following measures as a condition of approval: revise the PDP to incorporate the following measures in order to reduce the visual impact of the proposed landslide repair:

- Re-grade areas where landslides are repaired by removal and replacement methods so that the finished grade mimics the contour of the area immediately adjacent and the surface of the treated area is not unduly uniform or has angular features. Replant or reseed, as appropriate, disturbed areas with species that existed prior to disturbance.

- In areas where subsurface landslide repair is implemented, re-grade disturbed surfaces to match the original grade and replant or reseed, as appropriate, with species that existed prior to disturbance.

- Place debris fences as far back from and as far above Paradise Drive as possible. Retain all vegetation between the road and the debris fence and in the area where the fence is installed so as to provide as much screening of the fence from the road as possible. Specify an appropriate dark
color for debris fence material including posts and anchors that will minimize any color contrast with the immediate area where the fence will be installed.

**Significance After Mitigation**  Implementation of Mitigation Measure 5.8-5 would reduce adverse visual effects from landslide repair to a less-than-significant impact.

**Responsibility and Monitoring**  The applicant would be responsible to incorporate the measures into the PDP. Marin County would monitor implementation.

**Impact 5.8-6 Light Pollution**  
*Implementation of the proposed project would result in new lighting sources on the project site which could lead to increased light pollution. This would be a significant impact.*

Although a precise definition does not exist, light pollution is generally considered excessive or wasted light that does not increase nighttime safety, utility, or security. Such light produces glare, visual clutter, light trespass (i.e., unwanted light from a neighboring property or roadway), and wastes energy and natural resources. 10 A product of light pollution is *urban sky glow*, the brightening of the nighttime sky due to manmade lighting. 11

As landforms cannot generally be seen at night, the location, type, and quantity of light sources become dominating visual elements. Nighttime sources of light can include vehicle headlamps, streetlights, decorative outdoor landscape or security lighting, and interior lighting. Highly visible lights at night can disrupt views by interrupting the viewshed and may be seen for miles if geography and landscaping do not intervene. Moving sources of light and glare (e.g., vehicles) easily catch the eye and are difficult to ignore.

The project applicant did not submit a detailing lighting plan. The project application does state that exterior lighting should be limited to the minimum amount necessary to safely illuminate points of access and outdoor living areas. Furthermore it is stated that exterior lighting should be designed and located to avoid or to minimize visibility from surrounding properties and roadways. Exterior lighting generally should be avoided in areas which are visible from surrounding properties and roadways, unless necessary for safety or security. In areas where exterior lighting would be visible from roadway or surrounding properties, light fixtures should be mounted at low elevations and fully shielded to direct lighting downward to the immediate area underneath the fixture. Flood lighting would be prohibited as would night lighting for outdoor recreational activity areas.

The Design Review process would include a review of the location, type, intensity, and design of exterior lighting.

There would be an increase in light generated by the proposed project. As illustrated in the photo simulations, development on the project site would be visible from the four selected viewpoints (from the Old St. Hilary Open Space Preserve, the end of Heathcliff Drive, Paradise Drive, and Angel Island). Based on the photo simulations it is reasonable to conclude that nighttime lighting would be visible off-site. Without a detailed Lighting Plan, it cannot be assumed that the project would not result in substantial adverse changes. Therefore, this would be a significant impact.

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10 *The Problem with Light Pollution*, International Dark-Sky Association, Information Sheet 1, May 1996.

Mitigation Measure 5.8-6 The applicant shall prepare a Lighting Plan to incorporate into the Precise Development Plan. The lighting plan shall require:

- All light sources shall be shielded from off-site view;
- All lights shall be downcast;
- Escape of light to the atmosphere shall be minimized;
- Low intensity, indirect light sources shall be encouraged.
- Motion-activated lighting systems shall be encouraged.
- Security lighting of driveways, parking areas, and garages shall use low-level bollards with shielded light unless this poses a safety hazard (as determined by Marin County), in which case the area shall be lit using as few as possible, motion-activated shielded lights.
- Lighting of outdoor use areas and walkways shall be mounted on low-level elevation bollards or posts.
- Floodlighting shall be prohibited.
- Lighting of outdoor recreation areas, such as tennis courts, sports courts, and other similar outdoor recreational activity areas, shall be prohibited.
- Mercury, sodium vapor, and similar intense and bright lights shall not be permitted except where their need is specifically approved and their source of light is restricted.
- Submittals for Site Plan and Architectural Review shall include information on the location, types, intensity, and design of exterior lighting consistent with the Lighting Plan.

Significance After Mitigation Implementation of Mitigation Measure 5.8-6 would reduce adverse effects from nighttime lighting to a less-than-significant impact.

Responsibility and Monitoring The applicant would be responsible to prepare the Lighting Plan and to incorporate it into the PDP. Marin County would monitor implementation through design review.
5.9 CULTURAL RESOURCES
INTRODUCTION

While no Initial Study was prepared by Marin County for this EIR effort, an Initial Study was prepared by the Town of Tiburon in May 2000 for the 2001 Draft EIR. The 2000 Initial Study for that prior project determined that the project would not adversely affect an historic resource and would not destroy a unique paleontological resource, site, or geologic feature. However, due to the archaeological sensitivity of the Tiburon Peninsula, the 2000 Initial Study could not completely foreclose the possible discovery of archaeological resources or human remains during excavation or other construction activities on the site in the future. Therefore, Tiburon’s 2001 Draft EIR discussed the potential impacts on subsurface cultural materials which may be present on the site in order to provide mitigation measures for incorporation in the project. In addition scoping comments presented at that time raised questions about the historic significance and public use of “Spanish Trail”, a street which dead ends at the project site’s southern boundary. In response, Tiburon’s 2001 Draft EIR addressed the issue of the Spanish Trail. This information is presented again in this Draft EIR.

Public scoping comments received by the County in February 2009 regarding the proposed project’s impacts to cultural resources include concerns for the project’s impacts on Native American artifacts, historically significant trails (such as the Spanish Trail), and other cultural or potential cultural resources, such as the off-site Keil Cove.

As a part of the preparation of this Draft EIR an archival record and information search for the project areas was conducted in August 2009 by the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University. The information center record search file number is 09-0137. In addition a search of the Sacred Lands Inventory by the Native American Heritage Commission was conducted in August 2009.

PREHISTORIC AND ARCHAEOLOGICAL SETTING

The Tiburon Peninsula, particularly Ring Mountain, has been a focus of archaeological research since the 1900s. The lower slopes and Bay-oriented setting provided an attractive environment for prehistoric settlement, and dozens of miden-type sites are located adjacent to drainages and the bay shore.

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1 This subsection is based on the report Cultural Resources Investigations for the Easton Point Development Project, Tiburon, California prepared by David Chavez & Associates, April 1995. This report was prepared for Nichols Berman; a copy is on file and available for inspection at the Marin County Community Development Agency. The preparation of this report included a review of documents at the Historical Resources Information System Northwest Information Center (Sonoma State University, Rohnert Park), the Bancroft Library and Doe Library Map Room (University of California, Berkeley), the Marin County Civic Center Library California Room, and the Mill Valley Public Library History Room; this review was augmented by a field reconnaissance.
In the early 1970s, investigation of a site (CA-Mrn-27) concluded that the Peninsula was occupied as early as 2,000 years before the present and that complex social organization was in practice. By the late 1970s, a previously unknown collection of prehistoric rock art created by pecking on metamorphic rock outcroppings was discovered on Ring Mountain. The petroglyph-bearing rocks vary in size and in the number of forms on them. Neither the precise age nor prehistoric function of these prehistoric cultural features is presently known.

No rock art petroglyphs or other prehistoric archaeological sites are recorded on the project site, and no evidence of cultural resources was found in the 1987 and 1995 surface investigations of the site. Archaeological investigations on adjacent property west of the site documented no cultural sites. These findings suggest that the petroglyph features are concentrated in the western parts of Ring Mountain.

HISTORIC SETTING

Background on the Project Site and Vicinity

The first European settlement in Marin County was Mission San Rafael Arcangel, founded in 1817 in present-day San Rafael. The Spanish did not maintain any settlements on or near present-day Tiburon, and it was not until the Mexican period that individuals acquired large tracts of land. In 1834, the 7,845-acre Rancho Corte Madera del Presidio, the first of nearly 20 land grants issued in Marin County, was awarded to John Thomas Reed who built a sawmill and several adobe houses in present-day Mill Valley. He used the Tiburon Peninsula as a cattle ranch but did not maintain a permanent settlement in the area. There is no evidence of any permanent roads or trails in this area.

Following the deaths of John Thomas Reed (1843) and his wife, Hilaria Sanchez Reed (1868), the rancho was divided among their three surviving children - John Joseph, Hilarita, and Inez. Hilarita Reed owned the 1,091 acres at Punta (Point) de Tiburon which contained the 110-acre project site. By 1892, Marin County maps show Reed's land, now listed in the name of her husband, Benjamin F.

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4 Archaeological Field Inspections of the Marinero Estates Project, Tiburon, Marin County, California, Miley Holman, 1989 and A Cultural Resources Investigation of the Proposed Terraces Project, Tiburon, Marin County, California, Roger Werner, 1989.

5 This subsection includes information presented in the Cultural Resources Investigations for the Easton Point Development Project, Tiburon, California, David Chavez & Associates, April 1995.


7 Ibid., and Early Marin, Jack Mason, 1971, pages 13 and 16.
Lyford, whom she had married in 1872, had been reduced to 955 acres; it continued to be used as a cattle ranch. After the deaths of Benjamin Lyford (1906) and Hilarita Reed Lyford (1908), the land appears to have passed to nieces, nephews, and other family members who lived on a portion of it and sold the rest of their inheritance. (Benjamin Lyford and Hilarita Reed Lyford had no children.) By 1919, the project area lands were being surveyed for sale to the John R. Hanify Company. A company employee, John L. Reed, held a minor interest in the land. In 1923, Reed purchased the remaining interest from Hanify's estate. The Martha Company (named for Martha Reed, daughter of John L. Reed) is the current owner of the land and is a family holding company composed of John L. Reed's descendants.

**Spanish Trail Road**

In 1883, Benjamin Lyford platted a 150-acre health resort called Hygeia, the first real estate subdivision in Tiburon, on his and Hilarita Reed Lyford's Point Tiburon land. What later became known as Spanish Trail Road originally appears to have been part of the eastern extension of Vistazo East Street, in the 1883 Hygeia subdivision. Vistazo East Street originally was designed to loop around and join Centro East Street. Hugh Boyle, Jr., step-nephew of Hilarita Reed Lyford, subsequently told people who bought property from him that Vistazo followed an old road which he called the Old Spanish Trail and that Vistazo was one of the streets laid out by Dr. Lyford.

The 1899 United States Geological Survey (USGS) map of the Tiburon area shows the streets planned in the Lyford subdivision, including Vistazo East Street. Based on the scale of the map, Vistazo East Street appears to have been passable with a horse and carriage in the 1890s. However, the 1915 USGS map does not show the segment of Vistazo East Street which later became Spanish Trail Road, suggesting that the road had been abandoned. The street was probably not maintained because lots

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8 *Map of Marin County, California*, compiled from Official Surveys and Records by H. Austin, County Surveyor, and drawn by F. Whitney, 1873 and *Official Map of Marin County, California*, compiled from Records and Surveys by George M. Dodge, County Surveyor, 1892.

9 The information related to Spanish Trail Road is based on the report *Spanish Trail Historic Assessment, Tiburon, California*, Ward Hill, Architectural Historian, November 2000. This report was prepared for Nichols • Berman; a copy is on file and available for inspection at the Marin County Community Development Agency. The preparation of this report involved a field survey of the Spanish Trail Road and the part of the foot trail known as Old Spanish Trail, a review of a 1985 aerial photograph of the project site during the site survey, and research at the Belvedere-Tiburon Landmarks Society archive, Tiburon Library, and the Natural Resources Library Map Room (University of California, Berkeley).

10 The original subdivision map of Lyford's Hygeia is on file at the Belvedere-Tiburon Landmarks Society archive in Tiburon.

11 After John Thomas Reed's death (1843), his wife Hilaria Sanchez Reed married into the Garcia family. The daughter from her second marriage, Carmelita Natividad (step-sister to Hilarita Reed Lyford), married Hugh Boyle, Sr. (1865). Their son, Hugh Boyle, Jr., was step-nephew to Hilarita Reed Lyford. (*Shark Point-High Pontit, op. cit.*)


13 United States Geological Survey (USGS), *San Francisco 15-minute Quadrangle*, 1893-1895 (survey dates) and 1899 (map date).

in this area had not been developed. After World War II, part of the street was eventually paved and developed with houses. Considering the steep terrain of the original segment of the street crossing the project site, the street's original width likely eroded over time to the width of the trail that survives today; however, the 1980 USGS map still shows Spanish Trail continuing east as an unimproved road from the point where the present-day pavement ends.  

**Keil Cove**  

Around 1885 Hugo Keil purchased two parcels of land (a 34-acre parcel and a half-acre parcel with a freshwater spring) on the southeastern tip of the Tiburon Peninsula with the intent of developing a country estate and gardens. He chose the site, guided by the advice of his friend, the superintendent of Golden Gate Park John McClaren, because of its access to the Bay and its relationship to streams and a spring located on the hillside above the main body of the property. Keil wanted to build a lake on his new estate, and the protected cove and marsh next to the Bay provided a suitable location for this feature. McClaren determined that the streams and the spring provided an adequate water source for the lake and for the irrigation that would be needed to establish and maintain the proposed gardens. McClaren, who was one of northern California's foremost horticulturists and garden designers during the late 19th and early 20th centuries, subsequently prepared the site plan, the landscape design, and the design for the water delivery and drainage system for Keil's estate, which was given the name of Keil Cove, and oversaw the development of the plantings for the estate's garden and hillside forested areas during the 1890s and early 1900s.

Hugo Keil, who had no children, left the estate to his nephew Russell D. Keil, Sr., who in turn willed the property to his three children, the current owners. Keil Cove consists of the 34-acre estate located south of Paradise Drive (off the project site), a 0.51-acre parcel known as the "Lands of Keil" and its associated spring located in the geographic center of the project site, and an access right-of-way for the Lands of Keil.

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15 *San Quentin 7.5-minute Quadrangle*, USGS, 1980.

16 The information related to Keil Cove is based on a memorandum "Historic Resources Status of Keil Cove (including the Lands of Keil parcel and associated spring)" prepared by Denise Bradley, ASLA, Landscape Historian, March 2009. This memorandum was prepared for Nichols • Berman; a copy is on file and available for inspection at the Marin County Community Development Agency. The preparation of this memorandum involved a site visit to Keil Cove and an informational tour provided by the owner Russell D. Keil, Jr., on March 19, 2009 and a review of the *Keil Cove Baseline Documentation Report, Deed of Conservation Easement, Keil Cove, Tiburon, California (Keil Cove Baseline Documentation Report)* prepared by Russell A. Beatty, ASLA, in December 2001 for Russell D. Keil, Jr.; the purpose of the *Keil Cove Baseline Documentation Report* was to provide a short history and a description of the existing conditions for Keil Cove as part of the conservation easement granted by the Keil family to The Garden Conservancy on December 21, 2001.

17 *Grant Deed of Conservation Easement (Keil Cove)*, Russell Keil, et al., December 21, 2001; Denise Bradley communication with Russell D. Keil, Jr., March 2009; and *San Francisco 15-minute Quadrangle*, USGS, 1895 (surveyed 1892, 1893, and 1894).

The exact dates for the development of the landscape plan were not given in the *Keil Cove Baseline Documentation Report*, but the lake appears on the 1895 edition of the USGS *San Francisco 15-minute Quadrangle* (which was surveyed during 1882-1894), and roads and buildings for the estate appear on the 1915 edition of this map.

18 Denise Bradley communication with Russell D. Keil, Jr., March 2009.
The 34-acre estate consists of three major landscape areas: the central garden area, the lakeside area, and the perimeter plantations and woodlands. The central garden area, covering approximately 15 acres, is located around and south of the main house and is the organizing feature for the estate's designed landscape. Its main components include a terrace and fishpond, a swimming pool, driveways and paths, an arbor and a tennis court, a vegetable garden and an orchard, and a landscaped area around a barn, which has been converted to a residence. The vegetation features within the central garden area include over 230 species of plants that typify the diverse range of trees (including conifers, palms, broadleaf evergreens, and deciduous trees), shrubs, and vines that "were in vogue around 1900." The lakeside area includes a five-acre fresh water lake (with an island), plantings and a path around the perimeter of the lake, beach frontage, and a cypress windbreak between the lake and beach. The plantations and woodlands area, located on the slopes and the ridgeline that surround the built features and gardens of the estate, includes groves of Monterey pine and blue gum eucalyptus, planted under the direction of John McClaren, and naturally-occurring oak woodlands. Buildings on the Keil Cove property include three residences (the Main House and the barn, which was converted to a residence in 1930, were designed by architect Paul Ryan). Structures include various garden statuary and artifacts, a variety of outbuildings, the circulation system (entry gate, driveways, pedestrian paths, and fire roads), walls, and structures related to the water delivery and drainage systems. The site design and landscape features designed by McClaren remain in place and largely unchanged. There have been two additions to the central garden area: (1) a paved terrace and garden designed by the acclaimed landscape architect Thomas Church in 1941, which remains in tack, except for the replacement of redwood block pavers with asphalt paving, and (2) a swimming pool, designed by Russell Keil, Sr., in 1962 or 1963.

The water distribution system that supplies the fresh water used to irrigate the approximately 15 acres of gardens and landscaped grounds at Keil Cove (the plantations and woodland area are not irrigated) consists of the Lands of Keil spring, four water storage units (a 5,000-gallon redwood storage [built around 1985], a 5,000 gallon plastic tank [built in 1995], and two underground brick cisterns [built in the 1890s], one 60 feet deep and the other 40 feet deep), and a series of associated pipes, values, and pumps. The Lands of Keil spring water is piped to and stored in the two tanks, while the two cisterns store both tank overflow and groundwater inflow. (See description of the on-site drainage patterns in Section 5.5 Hydrology and Water Quality for a more detailed description of the functioning of the water distribution system.) The water distribution system remains basically the same as the one designed by McClaren; additions consist of the two tanks that were added, in 1985 and around 1995 respectively, to increase the on-site fresh water storage capacity.

The water drainage system was designed to intercept run-off from the hillside, through the estate, and into the lake. The system provides fresh water to the lake, which in turn serves as a large catchment basin, and includes a series of weirs and that catch basins collect and slow upland run-off (allowing sediment to settle), terracotta pipes that collect the water, and a system of gutters located along the sides of the main drive. Additionally, during periods of extreme run-off, water can also be diverted


21 Denise Bradley communication with Russell D. Keil, Jr., op. cit.
onto the drive and paved paths. Overflow from the lake can be released into a short channel, via a manually-operate weir, on the lake's south side where it flows into Raccoon Strait. The water drainage system remains basically the same as the one designed by McClaren although additional weirs and catch basins have been added by Russell Keil, Jr., to further enhance the system's ability to catch and slow run-off.  

**Summary**

No other historical resources, including the potential for historic archaeological features or deposits, are present on the site or have been previously located within the site's boundaries. Spanish Trail Road and Old Spanish Trail have not been listed nor determined eligible for local, state, or Federal designation as a historic resource. No Native American cultural resources listed on the Sacred Lands Inventory were identified within the project site.

The Keil Cove property, which includes the 0.51-acre "Lands of Keil" and its associated spring located in the geographical center of the project site, has not been listed nor determined eligible for local, state, or Federal designation as a historic resource and no California Register evaluation has been prepared for the property. However, based on the information provided in the Keil Cove Baseline Documentation Report, the Keil Cove property is assumed to meet the CEQA definition of a historic resource (discretionary significance) in order to evaluate cultural resources impacts for the Draft EIR.

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23 *Records Search Summary Letter for Easton Point – Tiburon (NWIC File No.: 09-0137), California Historical Resources Information System, 27 August 2009.*

Historical records do not mention the prominent rock outcropping located on the project site and locally referred to as "Founders Rock," and no information was found that would provide any indication of possible historical significance for this feature nor explain the term's derivation (David Chavez & Associates 1995).

Cultural Resources – Significance Criteria

The cultural resources analysis uses criteria from the State CEQA Guidelines and the Marin County Environmental Impact Review guidelines. Based on the State CEQA Guidelines the project would have a significant cultural resources impact if it:

- Caused a substantial adverse change in the significance of an historic resource as defined in State CEQA Guidelines Section 15064.5.
- Caused a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA Guidelines Section 15064.5.
- Directly or indirectly destroyed a unique paleontological resource or site.
- Disturbed any human remains, including those interred outside of formal cemeteries.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines, the project would have a significant cultural resources impact if it:

- Affected federal or State-listed resources.
- Disrupted or adversely affected a prehistoric or archaeological site, or a property of historic or cultural significance to a community or ethnic or social groups, or a paleontological site, except as part of a scientific study.
- Affected a local landmark of local cultural/historical importance.
Cultural Resources – Impacts and Mitigation Measures

NO OR LESS-THAN-SIGNIFICANT IMPACTS

Based on the findings of the analyses completed as a part of this EIR it has been determined that the proposed 2008 Easton Point Residential Development would have either no impact or less-than-significant impacts for the following significance criteria:

- Directly or indirectly destroy a unique paleontological resource or site.

There are no known unique paleontological resources within the vicinity of the project site. Therefore, no impact would occur.

IMPACT ANALYSIS

Impact 5.9-1 Potential Subsurface Resources

While no discernible impacts to archaeological resources or human remains are anticipated, the possibility cannot be precluded that prehistoric cultural deposits and features are present below the surface and could be damaged during land alteration activities. This would be a significant impact.

The record reviews, site surveys, and Native American consultation did not result in the identification of any ethnographic, prehistoric or historic sites within the project site. While the project site has been subjected to some land altering activities, buried or otherwise obscured cultural resources associated with prehistoric and historic period use of the area may still exist.

While no archaeological sites were identified as a result of this study, ground-disturbing activities could disturb previously unidentified buried or otherwise obscured cultural deposits and result in the loss of integrity of cultural deposits and a loss of information. Such adverse changes would represent a significant impact to cultural resources.

Mitigation Measure 5.9-1 The following mitigation measure would be required to mitigate significant impacts to cultural resources:

- Workers involved in ground disturbing activities shall be trained in the recognition of archaeological resources (e.g., historic and prehistoric artifacts typical of the general area), procedures to report such discoveries, and other appropriate protocols to ensure that construction activities avoid or minimize impacts to potentially significant cultural resources;

- In the event that archaeological artifacts, features or other cultural deposits are encountered during future grading, excavation, or other land alteration efforts, all work in the immediate vicinity of the find must be terminated until the discovery can be evaluated by an archaeologist. These discoveries may include prehistoric and / or historic materials. Depending on the extent and cultural composition of the materials, it may be advisable for subsequent excavations to be monitored by an archaeologist who would be ready to record, recover, and / or protect significant
cultural materials from further damage. In the case of prehistoric resources, consultation with interested Native American groups is advised; and

- In the event that human skeletal remains are discovered anywhere on the site, work in the vicinity of the discovery must be discontinued and the Marin County Coroner must be contacted. If skeletal remains are found to be prehistoric Native American (not modern), the Coroner will call the Native American Heritage Commission in Sacramento within 24 hours; they in turn will identify the person(s) believed to be the "Most Likely Descendant" of the deceased Native American. The Most Likely Descendant would be responsible for recommending the disposition and treatment of the remains. The Most Likely Descendant may make recommendations to the landowner or the person responsible for the excavation work regarding the appropriate treatment and disposition of the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.

**Significance after Mitigation** Implementation of Mitigation Measure 5.9-1 would reduce significant impacts to a less-than-significant level.

**Responsible and Monitoring** The applicant would be responsible for including this measure in the contracts of all contractors engaged in applicant-implemented construction and in the project's CC&Rs to require implementation by individual lot-owners and the Property Owners’ Association. In the event that prehistoric archaeological resources are discovered, local Native American organizations should be consulted and involved in making resource management decisions. All applicable State and local requirements concerning the handling and disposition of archaeological finds should be strictly enforced.

**Impact 5.9-2 Historic Significance of Spanish Trail**

Spanish Trail does not appear to have existed during the Spanish or Mexican periods or to be eligible for inclusion on the California Register, despite its historical interest locally, and does meet CEQA definitions as an historical resource. The project's effect on it would be less-than-significant.

Based on the archival research conducted in the *Spanish Trail Historic Assessment, Tiburon, California* report, it does not appear likely that Spanish Trail existed before Lyford's Hygeia subdivision. There is no evidence that Spanish Trail existed during the Spanish or Mexican periods (1776-1848) either as a trail or as a road. According to one local history, Hugh Boyle, Jr., a relative of the Lyfords, named Spanish Trail. While Spanish Trail has some local historical interest as a remnant of the Hygeia subdivision, the trail does not appear to retain sufficient historic integrity to be eligible for the California Register. The segment of Spanish Trail surviving today only seems to preserve a faint reminder of the original Vistazo East Street planned by Benjamin Lyford and depicted on the 1899 USGS map.

The applicant has indicated that the adjacent neighborhoods would have pedestrian access to the proposed open space in Parcel A from Spanish Trail Road as well as Straits View Drive. No public access easement, however, is proposed along or beyond Spanish Trail Road. Because Spanish Trail lacks historic integrity, future access to Parcel A or nearby development (such as of proposed Lots 21 through 23) would not affect Spanish Trail adversely. Unless Spanish Trail was to be designated as of local importance, there would be no basis for requiring the project to restore, maintain, or avoid the trail through mitigation.

**Mitigation Measure 5.9-2** No mitigation would be required.
Impact 5.9-3  Historic Significance of Keil Cove

Changes to the hydrology of the site resulting from the project could reduce or eliminate the available water supply that recharges Keil Spring, a key feature of the Keil Cove property, and could reduce the groundwater inflow from upslope areas on the project site into the two Keil Cove cisterns (See Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply.) The spring water and the groundwater inflow provide the sources for water used to irrigate vegetation features that are a key feature of the Keil Cove property.

Construction activities (see Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation) could result in erosion and downstream sedimentation that increase the risk of sedimentation to Keil Pond; Keil Pond is a key feature of the Keil Cove property.

These effects have the potential to cause a substantial adverse change in the historical significance of the Keil Cove property due to: (1) the adverse material alteration or loss of Keil Spring, (2) the adverse material alteration or loss of vegetation features, and / or (3) the adverse material alteration of Keil Pond. The Keil Cove property is assumed to meet the CEQA definition of a historical resource (discretionary significance) for the purposes of evaluating cultural resources impacts for the Draft EIR. These effects would be significant historical resource impacts.

Distant views of some of the houses on the project site would be visible from the southern end of the east side of Keil Pond and on the adjacent path around the pond. The addition of these views of the houses would alter the existing setting of the Keil Cove property but would not result in a substantial adverse change to the setting of Keil Cove as a historical resource.

KEIL COVE PROPERTY AS A HISTORICAL RESOURCE

The Keil Cove property, which consists of two discontiguous parcels, the 0.51-acre "Lands of Keil" and its associated spring (located within the project site) and a 34-acre parcel south of Paradise Drive (located off site), has not been listed nor determined eligible for local, state, or Federal designation as a historic resource, and no California Register evaluation has been prepared for the property.

However, based on the information provided in the Keil Cove Baseline Documentation Report, the Keil Cove property appears to:

- Embody the distinctive characteristics found in country estate landscapes in northern California during the late 19th-early 20th century.
- Embody the distinctive characteristics related to the range of species and types of plants used in large estates and public parks in northern California (and throughout California) during the late 19th-early 20th century.
- Embody the distinctive characteristics of large-scale forestation efforts in northern California during the late 19th-early 20th century.
- Represent the work of John McClaren, the long-term Golden Gate Park superintendent who was a noted horticultural expert and landscape designer in California during the late 19th and early 20th centuries. (McClaren designed the site plan, garden design, and water systems.)

25 The Keil Cove Baseline Documentation Report provided the following information on the Keil Cove property in relation to its potential historical significance and integrity:
Additionally, the terrace in the central garden area of Keil Cove represents the work of the renowned, 20th-century landscape architect Thomas Church. 26

Based on this information, the Keil Cove property (consisting of two discontiguous parcels: the 0.51-acre parcel known as the "Lands of Keil" and its associated spring located in the geographic center of the project site and the 34-acre parcel south of Paradise Drive, located off the project site) appears to have the potential to meet the CEQA definition of a historic resource (under the discretionary significance definition) and is considered a historic resource for the purpose of evaluating cultural resources impacts in the Draft EIR.

**CHANGES TO THE KEIL COVE PROPERTY'S HISTORICAL SIGNIFICANCE RELATED TO HYDROLOGY AND WATER QUALITY IMPACTS**

Section 5.5 Hydrology and Water Quality describes hydrology and water quality impacts that may affect Keil Cove (see Impacts 5.5-3 Site Drainage Patterns – Erosion and Downstream Sedimentation and 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply). Because the historical significance of the Keil Cove property is intricately tied to its vegetation features, whose existence depends on irrigation water that is supplied by Keil Spring and groundwater inflow from the project site, these hydrological impacts also are potentially significant historical resource impacts. Potential changes to the quantity and quality of groundwater have the potential to result in an adverse material alteration to the physical characteristics of the Keil Cove property which convey its historical significance. Features of the Keil Cove property that are particularly vulnerable to changes in groundwater include Keil Spring and the vegetation features.

"The residence was created in an era of wealthy estate builders in the early 20th century . . . John McClaren, one of northern California's foremost horticulturists and garden designers of the late 19th and early 20th centuries prepared the original site plan and garden design. (He served as the superintendent of Golden Gate Park for 53 years.) The gardens were adapted to the site, and its varying exposures, in a relaxed, informal design with no attempt to impress by borrowing styles from Europe. The place was designed to be used and enjoyed by the family. The diversity of trees reflects McLaren's horticultural interest. And the planting of eucalyptus and pine forests is consistent with other large scale planting efforts of the period, such as at San Francisco's Presidio and Golden Gate park and on the vast watershed lands in the East Bay Hills" (page 11).

"The garden contains a wide variety of mature trees and shrubs that give the effect of an arboretum. Many remain from the original planting of John McClaren and are typical of the diverse types of trees that were in vogue around 1900, a mixture of conifers, palms, broadleaf evergreens, and deciduous trees." (page 8).

". . . the garden, lake, and plantations are mature and largely unchanged" (page 11). (Russell Keil, Jr. provided additional information about the limits of changes to the property's features during a guided site tour on March 19, 2009.)

26 The Keil Cove Baseline Documentation Report provided the following information on the terrace in relation to its potential historical significance and integrity:

"The terrace was added in 1941 based on a design by Thomas D. Church, one of the world's most prominent and influential landscape architects of the 20th century. The terrace reflects the simplicity of form and materials in a modernist design that characterizes his gardens" (page 11).

"The redwood block paving that was originally installed in the two levels of the terrace decayed and was replaced with asphalt. The intent of the Keils is to remove the asphalt and install a suitable paving stone to reflect the original pattern of the Thomas Church design" (page 3). (Russell Keil, Jr. provided additional information about the integrity of the terrace and the limits of changes and during a guided site tour on March 19, 2009.)
Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply concludes that landslide repair and improvements required to stabilize existing slopes for the construction of homes could result in impacts to springs and seeps at the project site and/or conversion of site groundwater to surface water. The addition of impervious surfaces in the form of pavement and roof coverage would eliminate areas of existing groundwater recharge and increase local peak flow rates and surface runoff volumes. These potential impacts would reduce the available water supply to seeps and springs, including Keil Spring. The presence of the spring was one of the key reasons that Hugo Keil selected the site for his estate and its presence contributes to Keil Cove's historical significance. Its alteration or loss, due to the reduction or elimination of the available water that recharges the spring, would result in the physical alteration of the Keil Cove property such that its historical significance would be materially impaired. This would be a substantial adverse change to a historical resource.

Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply also concludes that although project dispersion devices and infiltration trenches have been proposed to mimic natural site hydrology, there is the potential for significant hydrological impacts to occur to Keil Spring and/or downgradient groundwater supplies on the Keil Cove property by reducing the availability of groundwater recharge areas through the construction of impervious surfaces and retaining walls at the project site. The Keil Cove property, a historical resource, depends on the water piped from Keil Spring and the groundwater inflow from upslope areas on the project site into the two Keil Cove cisterns to irrigate the vegetation features in the property's historic landscape. These vegetation features are a critical component of the property's historical significance. There are over 230 species of plants (including conifers, palms, broadleaf evergreens, deciduous trees, shrubs, vines, and perennials), within the approximately 15 acres of the central garden area in the Keil Cove property that: (1) represent the diverse range of plant materials found in large estates in northern California during the late 19th-early 20th century and (2) as a group form a collection that typifies the vegetation from this era in California landscape design. The reduction or loss of irrigation water would: (1) result in the decline in the health and the ultimate death of the existing vegetation features and (2) would preclude the replanting (restoration) of the vegetation features, in the future. The alteration or loss of the vegetation features at Keil Cove, due to the reduction or loss of irrigation water supplied by Keil Spring and/or other sources of groundwater inflow from upslope areas on the project site, would result in the physical alteration of the Keil Cove property such that its historical significance would be materially impaired. This would be a substantial adverse change to a historical resource.

Mitigation Measure 5.5-6 was designed to reduce the project's impact on the water supply system serving the Keil Cove property. Mitigation Measure 5.5-6 addresses the need to replace the water (in quantity and quality) that is necessary for irrigation on the Keil Cove property. While the implementation of these mitigation measures would alter the source of the water for the Keil Cove water delivery system, their implementation would allow the irrigation of the vegetation features to continue and thus would preserve this key component (the trees, shrubs, and other plants within the central garden area) of the historical resource (the Keil Cove property).

CHANGES TO THE KEIL COVE PROPERTY'S HISTORICAL SIGNIFICANCE RELATED TO EROSION AND SEDIMENTATION IMPACTS

Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation describes and analyzes potential erosion and sedimentation from project-related changes in hydrology that have the potential to increase sedimentation in Keil Pond. Because Keil Pond is part of the Keil Cove property (an historic resource), these hydrological impacts would also be potentially significant historical resource
impacts. Increased sedimentation in Keil Pond has the potential to result in an adverse material alteration to the physical characteristics of the Keil Cove property which convey its historical significance.

The analysis for Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation concludes that construction of impervious surfaces and storm drain systems in the site’s watersheds would increase peak flow rates in on-site drainageways and increase the risk of incision and instability in receiving drainageways and on hillslopes. In addition, grading of lots and roadways and installing utilities would disturb areas of the site and expose bared soil surfaces to the erosive forces of rainfall and runoff. This could result in downstream sedimentation and obstruction of hydraulic structures (culverts and catch basins), as well as increase the risk of sedimentation in Keil Pond.

Keil Pond is part of the Keil Cove property, a historical resource, and the unmitigated addition of sedimentation to the pond would result in an accelerated loss of depth in the pond and thereby decrease the amount of water in the pond. Hugo Keil selected this location for his estate because its location next to the bay (and the water sources provided by the spring and uphill streams) allowed him to construct a lake (Keil Pond). This lake is one of the key components in the design of Keil Cove. This design is significant as a representation of country estate landscape design in northern California from the late 19th-early 20th century and as example of the work of John McClaren. The addition of sedimentation would also lower the pond's capacity to store run-off (as designed by McClaren for the Keil Cove water drainage system). The effect of these changes would be the physical alteration of the Keil Cove property such that its historic significance would be materially impaired.

Mitigation Measures 5.5-3(a), (b), and (c) were designed to reduce potential construction and post-construction erosion and downstream sedimentation that could impact sensitive off-site habitats, including Keil Cove, to a less-than-significant level. By reducing the potential for sedimentation to Keil Pond, the implementation of these mitigation measures would also reduce the potential for substantial adverse change to the historical resource (the Keil Cove property).

CHANGES TO THE KEIL COVE PROPERTY’S HISTORICAL SIGNIFICANCE RELATED TO VISUAL QUALITY IMPACTS

The sloping topography of the Keil Cove property, the mature trees located on these slopes in the perimeter plantations and woodlands area, and the layout or organization of the property's central garden area result in the orientation of the primary or predominant views of the surrounding setting being directed out toward San Francisco Bay. However, distant views of some of the houses on the lots located along Ridge Road and Mt. Tiburon Road would be visible from the southern end of the east side of Keil Pond and on the adjacent path around the lake. The addition of these views of the houses would alter the existing setting of the Keil Cove property but would not result in a substantial adverse change to the setting of Keil Cove as a historical resource and, therefore, the impact would be less-than-significant.

Mitigation Measure 5.9-3(a) Mitigation Measures 5.5-3(a), (b), and (c), designed to reduce impacts associated with potential erosion and downstream sedimentation that could impact sensitive off-site habitats, including Keil Pond, to a less-than-significant level, would also be required to reduce the physical impacts that downstream sedimentation would have on Keil Pond which is a key component of the Keil Cove property (an historical resource) to a less-than-significant level.

Mitigation Measure 5.9-3(b) Mitigation Measure 5.5-6 is designed to reduce the project’s impact on groundwater supplies, Keil Spring and the Keil property spring-based water supply to a less-than-
significant level would also be required to reduce impacts on the Keil Cove property (an historical resource) to a less-than-significant level. As noted in Section 5.5 Hydrology and Water Quality implementation of Mitigation Measure 5.5-6 would require agreement and cooperation of the Keil Cove property owners.

**Significance After Mitigation** Implementation of Mitigation Measures 5.5-3(a), (b), and (c) and 5.5-6 would reduce the identified hydrology and water quality impacts to a less-than-significant level. In turn, the significant impacts on the Keil Cove property, identified as a historical resource, would be reduced to a less-than-significant level. Without the cooperation of the owners of the Keil Cove property to implement Mitigation Measure 5.5-6, the project impact on Keil Cove’s water supply would remain a significant and unavoidable.

**Responsibility and Monitoring** The responsibility and monitoring would be the same as for Mitigation Measures 5.5-3(a), (b), and (c), and 5.5-6.
6.0 ALTERNATIVES TO THE PROPOSED PROJECT
6.0 ALTERNATIVES TO THE PROPOSED PROJECT

This EIR examines several alternatives to the project as presently proposed. These alternatives include one on-site No Project alternative and three on-site development alternatives that are designed to reduce identified impacts. Alternative 2 is a 32-unit lower density alternative. Alternative 3 has been designed to reduce visual impacts and Alternative 4 has been designed to reduce impacts to biological resources. This chapter also includes an analysis of potential off-site locations.

These alternatives were developed to provide a realistic and representative range of potential uses and development strategies for the site. The principal criterion for selecting the alternatives studied in this Draft EIR was to ensure that the range of concepts evaluated would be sufficient to provide information to the public and public officials to make decisions about the project.

An EIR conceivably can analyze an infinite number of alternatives or variations of alternatives. However, CEQA directs EIRs to analyze a reasonable range of alternatives to the project or project location which would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects of the project. The analysis of a range of alternatives is governed by a "rule of reason" for alternatives that could feasibly attain the basic objectives of the project. Similarly, it is prudent to present feasible alternatives. In order for the analyses to be meaningful for readers, the alternatives must be distinct and readily discernible. This also is necessary to distinguish between their effects and determine the environmentally preferred alternative. As a part of the analysis, CEQA requires the specific alternative of “no project” shall be evaluated along with its impact.

As discussed above, the range of alternatives to be included in an EIR should focus on those which are feasible and capable of attaining the basic objectives of the project. The applicants' objectives and goals for the project are provided in Section 3.2 Project Description. In addition to the stated objectives of the proposed project, the three development alternatives should maintain consistency with the court order and decree contained in the 1976 and 2007 Judgments.¹ The Judgment decrees that the owners of the Martha Property are entitled to 43 homes on minimum one-half acre residential lots unless the parties subsequently agree otherwise in writing. The 43 residential lots are intended to be located on geologically safe portions of the site without the necessity for extensive landslide repair rather than in the path of known landslides. The 1976 and 2007 Judgments also state the County will allow some development within the Ridge and Upland Greenbelt.

6.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

Alternative 1, the No Project Alternative, assumes that no development would occur on the 110-acre project site. Mountain View Drive and Ridge Road would not be extended onto the project site. The upper elevations of the project site would maintain the same visual appearance, and there would be no new water tank constructed on the property. The 0.77-acre parcel owned by the MMWD would remain unchanged. There would be no need to construct a new pump house near the existing water

¹ Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, filed November 7, 2007 in County of Marin v. Martha Co. et al (Judgment) and Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, filed December 29, 1976 in Martha Co. v. County of Marin (1976 Judgment).
tank and the current paved access road to the water tank would remain in its existing alignment. With Alternative 1 no landslide repair work would be done and there would be no disturbance of the 0.51-acre Lands of Keil parcel and the existing spring from which water is drawn and piped to the Keil Cove property located down slope and southeast of the project site. Existing drainageways on the project site would continue to operate under natural conditions and the process of groundwater recharge would not be altered. Under Alternative 1 no new development would occur at the project site and the existing biotic habitats located on-site would not be disturbed. No new streets or driveways would be constructed off Paradise Drive and the existing utility infrastructure would remain as it is today.

The State CEQA Guidelines state that the No Project Alternative shall discuss “what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.” In the case of the 2008 Easton Point Residential Development the 1976 and 2007 Judgments supersede public plans and policies that would provide criteria for any other development that is reasonably foreseeable and could occur on the project site if the proposed project is not implemented. Therefore it is assumed that any reasonably foreseeable development would meet all of the criteria contained in the 1976 and 2007 Judgments which includes 43 residential lots with a minimum lot size of one-half acre, and some development allowed within close proximity to significant ridgelines.

Analysis of No Project / No Build Alternative

LAND USE AND PLANNING

With Alternative 1, the No Project Alternative, no new development would occur on the project site and there would be no environmental impacts resulting from the construction and operation of the proposed project. In particular, none of the impacts would occur that would be the result of, or contribute too, inconsistencies between the proposed project and public plans and policies as discussed in Chapter 4.0 Relationship to Public Plans. Although none of these “land use conflicts” would occur, Alternative 1 would also forego the opportunity to implement goals and policies contained in the Marin Countywide Plan, County Development Code, Paradise Drive Visioning Plan, and other public plans and policies applicable to the project site.

TRANSPORTATION

No development would occur on the site with Alternative 1. Therefore the project site would not contribute to traffic volumes, including construction traffic that would impact roads serving the project site including studied intersections along Tiburon Boulevard. Cumulative buildout of the surrounding area would still significantly impact study intersections (as discussed with Impact 5.1-2 Cumulative Buildout-Plus-Project Impacts to Study Intersections), however it should be noted that analysis of Impact 5.1-2 found the proposed project would not make a cumulatively considerable contribution to these significant cumulative impacts. These cumulative impacts would still need to be mitigated through the implementation of planned lane improvements and intersection signalization; however

2 State CEQA Guidelines, Section 15126.6(c)(2).
with the No Project alternative the project applicant would not be required to pay a fair share portion towards the cost of these improvements in the form of traffic impact / mitigation fees.

With Alternative 1 safety impacts resulting from inadequate sight distances on Paradise Drive (as discussed with Impact 5.1-3 Safety Impact Due to Inadequate Distances Approaching the Unsignalized Intersections of Paradise Drive with Project Access Roads) would not occur and the grading and construction activities to increase sight distance and widen Paradise Drive would not be necessary. Similarly, Impacts 5.1-6 Project Impact on Bicycle Facilities and Bicycle Safety Issues and 5.1-7 Project Impact on Pedestrian Circulation that would require mitigation measures to improve existing pedestrian and bicyclist safety issues along the portion of Paradise Drive that abuts the project site would not occur. By implementing these mitigation measures (5.1-6 and 5.1-7) the proposed project would make small incremental contributions to improve these safety issues. With Alternative 1 there would be no implementation of mitigation measures and these safety benefits would be lost.

Project impacts related to emergency access (Impact 5.1-9 Project Impacts Related to Project Site Emergency Access) would not occur with Alternative 1.

**AIR QUALITY**

There would be no construction under Alternative 1 and therefore there would be no construction-period air pollutant emissions (Impact 5.2-1 Construction-Period Air Pollution Emissions). With the proposed project, implementation of Mitigation Measure 5.2-1 would mitigate this impact to less-than-significant levels by modifying the proposed Construction Management Plan to require the use of construction equipment that meets higher emission standards for particulate matter and exhaust opacity, and by managing construction operations to prevent unnecessary idling of equipment and dust source control measures.

In regard to greenhouse gas emissions (GHG) (Impact 5.2-3 Greenhouse Gas Emissions) the proposed project would result in larger residences than existing homes in the adjacent neighborhood that typically consume more energy and would be located in an area that depends on private vehicles for transportation, resulting with the generation of more greenhouse gases than what would occur with Alternative 1. With Alternative 1 there would be no contribution from the project site to GHG emissions.

**NOISE**

With Alternative 1, existing noise levels at the project site would remain unchanged. Construction noise impacts from the development of the proposed project would be a significant unavoidable impact (Impact 5.3-1 Construction Noise), but would not occur with Alternative 1. However as discussed in Section 7.2 Cumulative Impacts, the area may still be subject to cumulative noise impacts resulting from construction activities for the development of other properties in the area.

**GEOLOGY AND SOILS**

Under Alternative 1 no development would occur on the site and existing geology and soils conditions would only be affected by naturally occurring processes and seismic activity. Alternative 1 would avoid impacts related to exposing new homes and their residents to landslide hazards (Impact 5.4-1 Landsliding) and slope stability issues (Impact 5.4-2 Slope Stability).
As discussed in Section 5.4 Geology and Soils, landsliding is a naturally occurring process and a number of landslide areas exist that potentially threaten off-site areas such as Paradise Drive (see Exhibit 5.4-1). In the winter of 1982 over 4,600 debris flow landslides occurred in Marin County in early January. Two homes adjacent to the site were damaged by debris flows from the 1982 storms. With Alternative 1 no repair work would be done to the landslides located on the project site.

HYDROLOGY AND WATER QUALITY

With Alternative 1 there would be no new development on the project site and, as mentioned above, none of the proposed landslide stabilization improvements would be done. In particular, the installation of subdrains to dewater landslide areas (see Exhibit 5.4-3) would not occur and sight distance improvements along Paradise Drive would not be necessary. The installation of these subdrains and other proposed landslide stabilization improvements would adversely affect the hydrology of the project site, and result in significant impacts. These include impacts to existing on-site drainage patterns (Impact 5.5-2 On-Site Drainage Patterns – On-Site and Off-site Flooding) and Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply.³

Additionally, with Alternative 1 impacts to water quality (Impact 5.5-1 Water Quality), erosion and sedimentation (Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation), and storm drain capacities and flood protection (Impact 5.5-7 On-Site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection) would not occur.

BIOLOGICAL RESOURCES

Under Alternative 1, the No Project Alternative, there would be no disturbance to habitats located on the project site. Therefore there would be no impacts to populations of special status plant and animal species (Impact 5.6-1 Impacts to Special Status Plants and Impact 5.6-2 Impacts to the California Red-Legged Frog), no disturbance to scarce habitat located on site such as seasonal fresh water wetlands (Impact 5.6-5 Disturbance to Jurisdictional Waters) and serpentine bunchgrass (Impact 5.6-3 Loss of Serpentine Bunchgrass). With Alternative 1 the coast live oak woodland located on site would not be disturbed (Impact 5.6-4 Loss of Coast Live Oak Woodland) and there would be no need to remove ordinance size trees from the project site (Impact 5.6-8 Loss of Ordinance-Size Trees). There would be no risk of disturbance to active bird nests (Impact 5.6-7 Disturbance to Active Bird Nests) or introduction of invasive exotic plant species (Impact 5.6-6 Introduction of Invasive Exotics) resulting from Alternative 1.

PUBLIC SERVICES

Alternative 1 would not increase the demand for any of the public services studied in this Draft EIR. Significant impacts to public services resulting from the proposed project (Impact 5.7-1 Fire Service, 5.7-7 Water Service Impacts, and 5.7-19 Open Space Impacts) would not occur. However, it should be noted that the proposed project would include vegetation management procedures that comply with

³ As explained in Section 5.5 Hydrology and Water Quality, Keil Spring is an in-holding within the project site it is considered an off-site hydrologic feature and impacts to Keil Spring are discussed in Impact 5.5-5 Groundwater Recharge and Off-Site Hydrology and in Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-Based Water Supply.
urban-wildland interface requirements by strategically removing trees and other vegetation near residences to reduce wildfire hazards by limiting the availability of vegetative fuels. With Alternative 1 the vegetative fuels on the project site would not be reduced and wildfire risk would remain as they currently exist. As discussed in water supply section of Section 5.7 Public Services if the proposed project is approved, the MMWD plans to improve the water pressure of the distribution systems for residences on Mountain View Drive, Ridge Road, and Straights View Drive by connecting these lines to the distribution system for the proposed project. With Alternative 1 this benefit would not occur. In addition Mitigation Measure 5.7-1(b) requires improvements to provide adequate emergency radio coverage at the lower elevations of the project site. This mitigation measure would also provide improved emergency radio coverage in nearby, off-site areas. With Alternative 1 this benefit would not occur.

**VISUAL QUALITY**

With Alternative 1 existing views of the project site from Tiburon Ridge (Viewpoint No.1), Heathcliff Drive (Viewpoint No. 2), Paradise Drive (Viewpoint No. 3), and Ayala Cove on Angel Island (Viewpoint No. 4) would not be changed. Therefore no significant changes to the visual quality of the project site would occur, and the significant unavoidable impacts to visual quality resulting from implementation of the proposed project would be avoided (Impacts 5.8-1 View from Tiburon Ridge, 5.8-2 View from Heathcliff Drive, and 5.8-4 View from Ayala Cove on Angel Island). Furthermore, with Alternative 1 there would be no landslide repair or artificial light source which would also impact the visual quality of the project site.

**CULTURAL RESOURCES**

As discussed in Section 5.9 Cultural Resources, it is not anticipated that archaeological resources or human remains would be unearthed during subsurface construction activities at the project site. However the possibility that prehistoric cultural deposits and other features are present below the surface of the project site cannot be ruled out. Any damage to these cultural resources would be a significant impact (Impact 5.9-1 Potential Subsurface Resources). With Alternative 1 there would be no development and therefore no impacts to potential subsurface cultural and archaeological resources would occur.

Additionally, with Alternative 1 there would be no impacts to Keil Spring which, as discussed under Impact 5.9-3 Historical Significance of Keil Cove, is the historic water source for irrigating the historical resources (gardens and pond) on the down slope Keil Cove property. With Alternative 1 there would be no impacts to Keil Spring resulting from depleted groundwater supplies (Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply), erosions and downstream sedimentation (Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation), and groundwater recharge and off-site hydrology (Impact 5.5-5 Groundwater Recharge and Off-Site Hydrology). The existing sedimentation occurring on the Keil property due to upslope erosion within the tributary Easton Point watersheds and its transport downstream, however, would continue under Alternative 1.
6.2 ALTERNATIVE 2 – 32-UNIT LOWER DENSITY ALTERNATIVE

On November 12, 2009 the Town of Tiburon and the Easton Point project applicant (the Martha Company) signed a Memorandum of Understanding (MOU) regarding a 32-Unit Lower Density Alternative (LDA) for the Easton Point project site. As a part of the MOU a draft Development Agreement was prepared. Exhibit C of the draft Development Agreement is the proposed site plan for the LDA. Also, as a part of the MOU it has been requested that Marin County evaluate the LDA as a project alternative in the Draft EIR. It is also requested that if the LDA is found environmentally equal or superior to the 43-unit project submitted to Marin County that the County approve the master plan, tentative subdivision map, and precise development plan for the LDA, and enter into a Development Agreement with the Martha Company substantially in the form provided by the Town.

Since the property owner has agreed in writing to accept a lower density, 32-unit project, if the terms of the MOU and draft Development Agreement are satisfied, the LDA has been included as a feasible alternative for analysis in this EIR.

Project Related Applications

The 32-Unit Lower Density Alternative (Alternative 2) would require the following approvals from Marin County:

- Master Plan approval
- Precise Development Plan approval
- Tentative and Final Subdivision Map approval
- Design Review approval for construction of future homes on individual lots
- Exception to Marin County Subdivision Standards (an exception is requested to Title 24, Development Standards, Section 24.04.110 (paved road width))
- Approval of a Development Agreement between Marin County and the Martha Company.
- Rezone the project site from Single Family Residential (R-1) and Residential Multiple Planned District (RMP-0.2) to Residential, Single Family Planned (RSP-0.5).

Alternative 2 Master Plan

Alternative 2 would create 31 residential lots plus one remainder lot for development of single family homes (50.54 acres). In addition two parcels (Parcel A 57.30 acres and Parcel B 1.99 acres) would be offered for dedication to the Marin County Open Space District. Parcel B is proposed as a Marin dwarf flax (a special status plant species) preserve. A 180,000-gallon concrete water tank would be constructed on Parcel C (0.17 acres). Roads and utilities would be constructed to serve each of the 31
residential lots. On-site landslides would be remediated or repaired to accommodate development. Individual homes would be developed by future owners of residential lots. Exhibit 6.0-1 summarizes proposed lands uses and Exhibit 6.0-2 illustrates the Alternative 2 Schematic Site Plan.

**Exhibit 6.0-1**  
**Summary of Land Uses – Alternative 2**

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**RESIDENTIAL LOTS**

The 31 residential lots would account for 36 percent (39.80 acres) of the entire site. The 10.74 acre remainder lot would account for ten percent of the entire site. The residential lots would range in size from 0.65 (Lot 3) to 10.74 (Remainder Lot) acres. Excluding the Remainder Lot, the residential lots would range in size from 0.65 (Lot 3) to 2.47 (Lot 13) acres.

Residential lots are proposed in the following areas:

- Seventeen (17) lots contiguous to the Hill Haven neighborhood, with access via Mountain View Drive to proposed Lot 1 and via Ridge Road to proposed Lots 2 through 17.

- Four (4) lots on Paradise Drive, with access via a new shared driveway off Paradise Drive to proposed Lots 18 through 21 adjacent to Old Tiburon at the existing Town boundary.

- Ten (10) lots off Paradise Drive near MMWD’s Paradise Water Tank, with access via Forest Glen Court, a new road generally following the existing water tank service road alignment, to proposed Lots 22 through 31.

- One (1) Remainder Lot with access from Paradise Drive.

Each residential lot would include a Residential Building Envelope plus a Building and Landscape Envelope (see Exhibit 6.0-2). The Residential Building Envelope would be wholly contained within
the Building and Landscape Envelope. In addition, some of the residential lots would include a designated Natural Area. 4 For those lots with a natural area a schematic fence line is shown.

One single-family home plus any guest home would be located within each lot’s Residential Building Envelope. Conceptual building footprints are shown for each Residential Building Envelope on Exhibit 6.0-2. The building footprint locations are illustrative only, provided to demonstrate that buildings of the proposed size (see Exhibit 6.0-3) would fit within the proposed building site for each lot. In addition to garages and guest houses other accessory uses such as pools, cabanas, gazebos, decks, patios, sports courts and swing sets would be permitted within the Residential Building Envelope.

Landscape, hardscape, and structures not designed for sleeping may be located anywhere within the Building and Landscape Envelope. The Building and Landscape Envelope for each lot may be fully enclosed with a six-foot high open wire fence. One exception to the allowed fencing is that fencing within 20 feet of the edge of the pavement on Ridge Road or Forest Glen Court would be permitted only with design review approval. In addition, for Lots 5 and 6 fencing within 20 feet of the edge of the pavement of the driveway which would serve Lots 6 through 8 would require design review approval. Residential landscaping shall be limited to the Building and Landscape Envelope.

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4 In the draft Development Agreement the Natural Area is referred to as Private Open Space. These terms have been used interchangeably.
## Exhibit 6.0-3
### Residential Lot Summary – Alternative 2

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Acreage</th>
<th>Square Feet</th>
<th>Maximum House Size</th>
<th>Footprint (Site Plan)</th>
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</table>

a Rounded to the nearest square foot.

Source: Tiburon LDA Lot Data 12/15/09
Lots 5 through 17, 19, 21 through 23, 25 through 31 and the Remainder Lot would include a Natural Area. It is the intent that following completion of construction that the Natural Area be visually indistinct from the proposed open space (Parcels A and B). Development within the Natural Area would be limited to activities such as grassland and tree mitigation planting, vegetation management for compliance with fire regulations, landslide repair, drainage improvements and installation of underground utilities.

Exhibit 6.0-3 shows the size of each of the 31 residential lots and the Remainder Lot along with the maximum square footage of all structures and building footprint for each lot. For the 31 lots the maximum square footage of all structures would range in size from 4,800 square feet (Lots 1 through 4) to 10,000 square feet (Lots 22 through 31). The footprints for the 31 residential lots would range in size from 2,500 square feet (Lots 13 and 18) to 5,070 square feet (Lot 30). For the Remainder Lot the maximum square footage of all structures would be 15,000 square feet and the footprint would be 7,350 square feet.

In general, the calculation of the maximum square footage of all structures would include all habitable area (housing units and possible guest house) including garages, carports, and accessory buildings. The maximum square footage would not include such features as fences, features associated with landscape design (such as trellises, gazebos, and fountains) and features which are three feet or less above grade (such as pools, decks, and sports courts).

PUBLIC OPEN SPACE AND TRAILS

Two open space parcels (Parcel A 57.30 acres and Parcel B 1.99 acres) would be offered for dedication to the Marin County Open Space District. Parcel A is proposed to provide a greenbelt buffer between parts of the Hill Haven neighborhood and the proposed residential development.

The Easton Point Property Owners’ Association would retain four easements across Parcel A:

- A drainage easement;
- An easement for the construction, use, and maintenance of a temporary construction access road;
- An easement for the planting of trees, with the species of such trees to be designated by Marin County Open Space from a list of species determined by Marin Community Development Agency-Planning Division or Design Review to be appropriate as replacement trees; and
- An easement for any future work required for health and safety, including landslide stabilization and – to the extent that Marin County Open Space fails to maintain vegetation on Parcel A in accord with any future local, county, and state fire safety standards – the ability to cut or clear vegetation in accord with such future fire safety requirements.

As a part of Alternative 2 the project applicant would construct three hiking trails across the project site, as follows:

- From the point where Ridge Road enters the project site along the property line, adjacent to the boundary of Lots 3 and 4, and then across the site, generally paralleling the water tank access road, to the Old St. Hilary’s Open Space Reserve. This trail would also provide access to the large rock in Parcel A between Lots 4 and 17.
• From the end of Spanish Trail Road across the public open space to Paradise Drive at a point between Forest Glen Court and the Remainder Lot driveway.

• A third trail would be constructed in the roadbed remaining after removal of the proposed construction access road.

The proposed trails are intended to be serviceable single-use (hiking) footpaths, as commonly found on steep hillside trails throughout Marin County. The first two trails would be completed prior to the issuance of the first certificate of occupancy for any residence within the project site. The trail to be constructed after removal of the construction access road would be created simultaneously with removal of the construction access road paving.

Although all roads and driveways would be private, public access to Ridge Road and Forest Glen Court would be provided.

Within the project site, no sidewalks would be provided, thus, pedestrians would share the roads and driveways with motor vehicles and bicyclists.

Parcel B is proposed for the protection of the Marin dwarf flax. No public access is proposed for Parcel B.

**BICYCLE FACILITIES**

The LDA plan does not include any bicycle accommodations. Similar to the proposed project a four-foot shoulder would be provided along the project site’s Paradise Drive frontage that could accommodate southbound bicyclists on Paradise Drive between Forest Glen Court and the Lots 18 through 21 driveway. Improvements along the Paradise Drive frontage would include consideration of bicyclist’s needs.

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**Alternative 2 Precise Development Plan**

The phase one Alternative 2 Precise Development Plan (PDP) is proposed to permit the construction and development of the necessary infrastructure to support the proposed 31-residential unit subdivision plus one Remainder Lot. The PDP does not include specific house designs, nor does the applicant seek Design Review at this time. As with the proposed project design review approval would be required for each home before construction would occur.

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5 Email communication to John Roberto and Bob Berman from Mary K. McEachron, February 10, 2010.

6 *Focused Traffic Study for the Martha Company Project*, W-Trans, March 17, 2009, page 4,
ARCHITECTURAL DESIGN CONCEPT AND GUIDELINES

The Alternative 2 PDP includes applicant-proposed Architectural and Landscape Design Guidelines (Design Guidelines) similar to that of the proposed project. The Design Guidelines would be included in the Conditions, Covenants and Restrictions for the lots in the LDA. The Design Guidelines would be used by the Property Owner’s Association and if approved by the County of Marin to guide the Design Review for the individual lots. The design for each house would be subject to review and approval by both the Property Owners’ Association and Marin County through its design review process. Some of the proposed Design Guidelines are different from standards and definitions contained in the Marin County Development Code and if adopted would supersede the relevant standards and definitions in the Development Code. The proposed Design Guidelines are summarized below:

Sustainable Design

It is proposed that all buildings should incorporate sustainable design features into the design of the individual houses. These design features would include:

- Passive solar design.
- Active solar energy where neighbors are not unreasonably affected.
- Geothermal energy
- Energy conservation design.
- Use of recycled or recyclable building materials.
- Prohibition on wood-burning stoves or fireplaces that do not incorporate state-of-the-art engineering measures designed to prevent release of particulate matter.

Building Bulk, Mass, and Scale

Exhibit 6.0-3 shows the proposed maximum square footage of all structures on each lot and an illustrative building footprint for each lot.

- The calculation of the maximum square footage would be based on the method set forth in the Tiburon Zoning Code (as of October 26, 2009) including the Code’s definition of “Floor Area, Gross” except that garages, carports and accessory buildings would be counted towards the square footage.

Building Heights

Residential building heights would be limited depending on the lot location.

- Lots accessed through Hill Haven neighborhood. For Lots 1 through 8 and 10 through 17 homes shall not exceed a maximum of 30 feet in height, as measured from existing grade. The height of

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7 Architectural and Landscape Design Guidelines for Easton Point, Easton Point – Project Narrative, applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009, Appendix D.
the home on Lot 9 shall not exceed 18 feet from existing grade on the uphill side, but the building may step down the slope if permitted by design review. No building or structure on Lot 9 shall break the plane of the San Francisco Bay water view as seen from the trail above at a to be determined Global Positioning System coordinate. Accessory structures shall not exceed 15 feet in height above grade.

- Lots accessed from Paradise Drive. For Lots 18 through 31, where there is a Residential Building Envelope with a percent of slope that exceeds 30 percent homes shall not exceed 35 feet from existing grade. Accessory structures shall not exceed 15 feet above existing grade.

- For the Remainder Lot the house shall not exceed 30 feet in height, as measured from existing grade.

**Viewshed Protection**

As discussed above, a Residential Building Envelope and a building footprint for each residential lot is shown on the Alternative 2 Schematic Site Plan (see Exhibit 6.0-2). As with the proposed project there is a rebuttable presumption that a home of that lot coverage and shape will be permitted on each lot within the building footprint shown. The intent is that each lot owner would be cognizant of the construction that would likely be permitted on adjacent lots and should accordingly plan his/her own windows and view corridors in order to preserve privacy and views even after buildout of adjacent lots.

It is proposed that under specific circumstances lot owners would be permitted to build outside of the designated footprint if they meet certain conditions. Such a lot owner would need to demonstrate that the proposed residence would avoid highly visible areas, minimize interference with existing views on surrounding properties and demonstrate that other lot owners and public trail uses would not be significantly disadvantaged by the building location.

**Hillside Building Design**

Buildings situated in hillside areas should be designed to visually blend with the surrounding topography to minimize the prominence of structural height, bulk, and massing as viewed from surrounding properties and roadways. The following design criteria are proposed for building on a hillside:

- General building form should include low profile one- and two-story levels stepped down hillsides to conform to the surrounding natural terrain.

- Uphill views of homes should present a low-slung horizontal silhouette by integrating deck and foundation design into the shape of the building and site topography.

- Downhill views of homes should present a pleasing roof-scape of low-pitched and gabled and hip roofs.

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8 The percent of slope shall be calculated before residential grading and shall be measured along a line passing through the center of the Residential Building Envelope and perpendicular to the natural contours.

9 As a legal term, a rebuttable presumption is an assumption made by a court, one that is taken to be true unless someone comes forward to contest it and prove otherwise.
**Exterior Lighting**

*Alternative 2* assumes that exterior lighting would be limited to the minimum amount necessary to safely illuminate points of access and outdoor living areas. Exterior lighting would generally be avoided in areas which are visible from surrounding properties and roadways, unless necessary for safety or security.

Night lighting for recreational use of tennis courts, sports courts, and other similar outdoor recreational activity areas would be prohibited to avoid glare and noise intrusion from nighttime use of such areas. In areas where lighting would be visible from roadways or surrounding properties, light fixtures should be mounted at low elevations and fully shielded to direct lighting downward to immediate area underneath the fixture.

**Exterior Building Materials and Colors**

Exterior building facades would be treated with materials and colors which visually blend with the surrounding environment, minimize contrast with the natural backdrop when viewed from off-site locations, minimize glare, and are fire resistant.

**Fencing**

As discussed above, the Building and Landscape Envelope for each lot may be fully enclosed with a six-foot high open wire fence. One exception to the allowed fencing is that fencing within 20 feet of the edge of the pavement on Ridge Road or Forest Glen Court would be permitted only with design review approval. In addition, for Lots 5 and 6 fencing within 20 feet of the edge of the pavement of the driveway which would serve Lots 6 through 8 would require design review approval.

**LANDSCAPE DESIGN CONCEPT AND GUIDELINES**

Under *Alternative 2* landscaping would respect the primary viewsheds available to surrounding residents and to users of the public open space. The location and species of new landscaping would be regulated by the Property Owner’s Association to ensure that existing scenic views would be preserved. On-site landscaping would utilize primarily native plant species which are compatible with the surrounding natural environment of the project site. Existing trees and natural vegetation would be retained where possible. Introduced landscaping would include 80 percent California native species tolerant to drought, fire, and frost which are consistent with plants approved by the Marin Municipal Water District. Trees and other vegetation endemic to mixed evergreen forest and open grass lands would be encouraged in landscape plans. The use of invasive species would be prohibited, including those listed in the State’s noxious Weed List, the California Invasive Plant Council’s list of *Exotic Pest Plants of Greatest Ecological Concern in California* and other priority invasive species as identified by the agricultural commissioner and California Department of Agriculture.

The *Alternative 2* PDP includes a conceptual landscape plan, consistent with the *Alternative 2* landscape design guidelines, for the proposed project 10 and provides a sample landscape design for

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two typical building sites (Lot 19 and Lot 28).  A list of typical plants consistent with the proposed guideline, and a list of prohibited plants, is also provided.

**Urban-Wildland Interface Restrictions**

Alternative 2 would require a Fuel Modification and Landscape Management Plan be included in the Covenants, Conditions and Restrictions (CC&Rs). This plan will inform property owners that they are responsible on an on-going basis for reducing flammable vegetation and debris, not only within their own fuel modification zones but also within any area of their property that may fall within a fuel modification zone for a neighboring structure. The following standards are included:

- **Home Ignition Zone** (the home plus ten feet) – Only small shrubs and small ornamental trees (spread out) would be allowed. No dead or dry grass or brush, shrubs, or trees would be permitted.

- **Defensible Space Zone** (11 to 50 feet) – Regular trees would be allowed, but spaced very far apart and limbed up ten feet or one-third of their live crown height, whichever is greater. No dead or dry grass, brush, shrubs, or trees would be permitted.

- **Wildland Fuel Reduction Zone** (50 to 100 feet) – All undergrowth must be removed, densely crowed smaller trees must be thinned out, and mature trees must be limbed up as in the Defensible Space Zone.

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**Tree Loss**

An estimate of the number of trees to be removed from each proposed lot in *Alternative 2* has been prepared. 12 Trees to be removed as part of the fire defensible space plan and due to tentative map improvements are identified. It is estimated that 980 trees would be removed due to individual lot development, Urban Wildfire Interface regulations, and landslide stabilization. 13 Exhibit 6.0-4 provides a summary of tree loss due to site development.

**Exhibit 6.0-4**

**Estimated Tree Removal – Alternative 2**

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<th>Location</th>
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<td>Outside Fire Zone</td>
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<td><strong>Subtotal Trees Removed for Lot Development</strong></td>
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<td><strong>Total Number of Trees to be Removed</strong></td>
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Source: Town of Tiburon’s 32 Lot Lower Density Alternative Tree Removal - Summary Table 3/10/2010

To mitigate for the loss of trees the following would be done:

- During the Design Review stage, each applicant must identify the location and protection zone for every major tree affected. Building footprints may be adjusted to minimize removal of native trees.
- Lost trees would be replaced with over-story species (native oaks, bay and madrones) and under-story species typical of the impact zone (such as toyon and ceanothus).
- Lost native trees would be replaced at the following ratios:
  - 3:1 for oak, bay, redwood trees six inches at breast height.
  - 4:1 for oak, bay, redwood trees seven to 12 inches at breast height.
  - 5:1 for oak, bay, redwood trees greater than 12 inches at breast height.


During the Design Review for each house it would be necessary to identify all trees to be removed and appropriate restoration sites within Parcel A or compliance with the provisions of alternative mitigation measures included in the certified Final EIR.

**ENFORCEMENT OF ARCHITECTURAL AND LANDSCAPE DESIGN RESTRICTIONS**

*Alternative 2* assumes the creation of an Easton Point property owners’ association (POA) and incorporation of a declaration of Covenants, Conditions and Restrictions (CC&Rs) into the Final Subdivision approval. The Easton Point Property Owner’s Association would have long-term responsibility for administering and enforcing the deed restrictions contained in the CC&Rs concerning architectural and landscape design.

Membership in the POA would be mandatory with the purchase of a residential lot and would involve payment of fees to operate the POA. The CC&Rs would impose legally-binding commitments on residential lot owners and would be a perpetual part of the property deed, transferred with the sale and resale of the property. A POA Design Review committee would review plans and be advisory to Marin County or Town of Tiburon Design Review. The POA Design Review committee would not supersede or substitute for the County’s or Town’s design review and approval authority.

The CC&Rs would grant to Marin County and / or the Town of Tiburon the power but not the responsibility to ensure that the provisions pertaining to maintenance of common improvements and landscaping, and public access to Ridge Road and Forest Glen Court are honored. Marin County and / or the Town of Tiburon would be a third-party beneficiary with independent rights of enforcement and shall provide that the provisions pertaining to Ridge Road and Forest Glen Court and maintenance of common improvements and landscaping may not be amended without Marin County’s or Town of Tiburon’s prior consent.

**CIRCULATION**

Site access would be provided by extensions of some existing streets and construction of new roads, as follows:

- A driveway would be extended from the cul-de-sac at the end of Mountain View Drive within the Hill Haven neighborhood to serve proposed Lot 1.

- Ridge Road, an existing 24-foot wide road, would be extended for a distance of about 1,400 feet as a 20-foot wide paved roadway within a 40-foot wide roadway and utility easement and would terminate in a cul-de-sac (the roadway would be 24-foot wide at the entry to the cul-de-sac). It would serve proposed Lots 2, 3, 5, and 9 through 17 directly and also would serve proposed Lot 4 plus Lots 6 through 8 indirectly via shared driveways. The driveway to Lot 4 would be 12-foot wide. The driveway to Lots 6 through 8 would be 450 feet long and 16-foot wide.

- Water Tank Road would be a new road off of the extension to Ridge Road. It would provide access to the to the proposed MMWD water tank. It would be a 16-foot paved roadway (with two foot shoulders) within a 25 foot wide private access, utility easement and emergency vehicle access. It would end in a cul-de-sac where a 12-foot wide driveway would extend to the water tank. The intent of the draft Development Agreement is that Water Tank Road shall be made as informal as possible while still being adequate for construction traffic, Tiburon Fire Protection District, and MMWD purposes.
Paradise Drive would have intersections with two proposed driveways and one proposed road, as follows:

- A new 16-foot wide paved driveway off of Paradise Drive would provide access to proposed Lots 18 through 21. It would narrow to 12-foot wide at the approximate mid-point of Lot 20.

- Forest Glen Court would intersect Paradise Drive at the present location of the existing MMWD water tank service road and would generally follow the alignment of (but would replace) the 25-foot wide service road for a distance of about 800 feet. The new 20-foot wide paved roadway within a 40-foot wide roadway and utility easement would serve Lots 22 through 31. Lots 26 through 28 would be served by a 12-foot wide driveway. Forest Glen Court would terminate in a cul-de-sac (the roadway would be 24-foot wide at the entry to the cul-de-sac).

- In the northern part of the site, about 1,300 feet north of the proposed Forest Glen Court / Paradise Drive intersection an approximately 1,600 foot long driveway would serve the Remainder Lot. Two turnouts would be provided, and the driveway would end in a cul-de-sac.

- A temporary construction access road would be constructed from the terminus of Forest Glen Court to the driveway serving the proposed MMWD water tank. The construction access road would be ten feet wide with turnouts and paved with grooved concrete.  

The draft Development Agreement provides for the eventual removal of the construction access road, unless otherwise approved by Marin County. The paving, guard rails, and runaway truck ramp for the construction access road would be removed and the roadway would be re-vegetated or otherwise made suitable for trail use. Removal of the construction access road would occur during the first construction season after either, at the County’s discretion, 12 of the homes to be constructed on Lots 1 through 17 have been granted a certificate of occupancy, or ten years from the effective date of the Development Agreement. After removal of the construction access road all subsequent construction access to Lots 1 through 17 would be through the Hill Haven neighborhood.

The draft Development Agreement also states that if Lots 1 through 8 or Lots 9 through 17 are dedicated to non-residential uses, then the construction access road need not be built. In this condition construction access to Lots 1 through 8 or Lots 9 through 17, as the case may be, would be through the Hill Haven neighborhood.

The new roadways are not proposed for dedication to Marin County. Rather, the new roadways would be private roads and maintained by the POA.

The Marin County Code (MCC) establishes minimum standards for paved street widths. The standard for minimum paved width for minor residential roads is 28 feet. Ridge Road and Forest Glen Court would qualify as minor residential streets and would normally be subject to the 28 foot paved width standard.

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14 The Development Agreement provides that if all lots in either the Lots 1 through 8 cluster or Lots 9 through 17 cluster are dedicated to non-residential uses, then the construction access road would not be built and construction access to Lots 1 through 8 or to Lots 9 through 17 would be through the Hill Haven neighborhood.

15 Marin County Code, Marin County Board of Supervisors, Section 24.04.110 (width), 1994.
The PDP proposes narrower roads than the design standards in the MCC. As discussed above, Ridge Road and Forest Glen Court would have a 20-foot wide paved roadway. It would be necessary under Alternative 2 to receive an exception to the County standards for the proposed road widths. The MCC does provide procedures for exceptions to the standards. 16

**Road Grades**

Roadway segments (including driveways) would have grades of up to 18 percent (See Exhibit 6.0-5). The construction access road, however, would have a maximum grade of 25 percent.

**Exhibit 6.0-5**  
**Road Grades – Alternative 2**

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<thead>
<tr>
<th>Roadway / Driveway</th>
<th>Maximum Grade (percent)</th>
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<td>Lots 3 to 4 Driveway</td>
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</tr>
<tr>
<td>Lots 18 to 21 Driveway</td>
<td>17</td>
</tr>
<tr>
<td>Lots 26 to 28 Driveway</td>
<td>12</td>
</tr>
<tr>
<td>Construction Access Road</td>
<td>25</td>
</tr>
</tbody>
</table>

a. Driveway to water tank has a maximum grade of 17 percent.

Source: *Town of Tiburon’s 32 Units LDA, Easton Point Master Plan / Precise Development Plan / Tentative Map, Sheets C-6, C-7, C-8, C-9, C10, CSW / Stuber-Stroeh Engineering Group, Inc, revised 12-15-09.*

**Parking**

Each residential lot would be provided with a minimum of four off-street parking spaces, two of which would be in a garage.

**Off-Site Improvements**

Under Alternative 2 off-site traffic improvements include the following:

- Improve the Forest Glen Court / Paradise Drive intersection to provide a minimum of 150 feet of sight distance in both directions for outbound vehicles.

- Post signs prohibiting parking along both sides of Diviso Street and along other residential streets in the Hill Haven neighborhood narrower than 20 feet wide.

- Provide stop or yield sign control for the side streets intersecting Ridge Road.

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• Widen the Paradise Drive roadway to include four-foot shoulders with 60-foot tapers at the driveway for Lots 18 through 21 and the proposed Forest Glen Court intersection.

PUBLIC FACILITIES AND UTILITIES

The Alternative 2 PDP includes a Utility Plan. Project implementation would involve the extension and installation of on-site water facilities, sewer facilities, and other utilities (gas, electricity, telephone, cable television) and on-site installation of drainage facilities. Proposed public facilities would be connected to those of the Marin Municipal Water District (MMWD) and Sanitary District No. 5. The PDP Utility Plan shows the location of proposed on-site street lights. All utilities would be constructed underground.

Water

The Alternative 2 PDP proposes construction of a new 180,000 gallon water tank on a 0.17 acre parcel (Parcel C) adjacent to the Old St. Hilary’s Open Space Preserve. The new tank would have a pad elevation of 580 feet be 20 feet tall and 40 feet in diameter. The new tank would connect to the existing 160,000-gallon Hill Haven Water Tank located at the present end of Ridge Road.

Should the project site be annexed in the future to the Town of Tiburon, the draft Development Agreement provides a mechanism for the possible relocation of the proposed water tank. It is possible that, at the direction of the Town of Tiburon, the location of the proposed water tank could be relocated within Parcel A. The designation of a new location for the water tank would require the concurrence of both the Tiburon Fire Protection District (TFPD) and the Marin Municipal Water District (MMWD). The TFPD must concur that at its new location domestic water and fire flow to all residential lots within the project site would be adequate to serve homes of the maximum size permitted. The MMWD would also need to agree to placement of the water tank at the new location.

Another possible location for the water tank is on the adjacent Old St. Hilary’s Open Space Preserve just upslope of the current proposed location (see Exhibit 6.0-6). The 180,000 gallon water tank would be buried underground. A 16-foot wide (12 foot wide travel lane with two foot-shoulders) paved access road would connect the water tank site to the on-site Water Tank Road. The water tank site would be approximately 0.65 acres. The access road and water line would need to be constructed within a MMWD easement area within the Old St. Hilary’s Open Space Preserve. Locating the water tank within Old St. Hilary’s Open Space Preserve would require the Marin County Open Space District (MCOSD) to transfer a portion of the preserve to the MMWD. The transfer of this area may not be consistent with MCOSD’s Boundary Adjustment Policy (approved by the District Board of directors on December 5, 1985). Additionally the MCOSD has “dedicated” Old St. Hilary’s Open Space Preserve pursuant to Section 5540 of the California Public Resources Code. This dedication restricts the MCOSD’s ability to transfer the land.

The existing 12-inch water line serving the 1,000,000-gallon Paradise Water Tank would be relocated along the alignment of Forest Glen Court. A new pump station would be constructed at the existing water tank to serve the proposed 180,000 gallon tank.

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17 Town of Tiburon’s 32 Units LDA, Utility Plan, Easton Point Master Plan / Precise Development Plan / Tentative Map, Sheet C-3, CSW/Stuber-Stroeh Engineering Group, Inc, revised 12-15-09.
Exhibit 6.0-6
Alternative Water Tank Site

Source: International Planning Associates, CSW/Stuber-Stroeh, January 13, 2010
New water distribution pipelines would be constructed to serve the proposed 31 lots. In general Lots 2 through 17 would be served by new water lines connected to the proposed new water tank.

Lots 18 through 21 would be served by a new water line connected to the existing water line in Paradise Drive.

Lots 22 through 31 would be served by a relocated water line in Forest Glen Court.

Lot 1 would be served by the existing water line in Mountain View Drive.

No provision has been provided to provide water to the Remainder Lot. One possible method to provide both domestic and fire flow water would be to install a meter box in the Forest Glen Court cul-de-sac, than construct a water line part way up the construction access road and then across Parcel A to the Remainder Lot.

The Alternative 2 PDP Utility Plan also shows future location of fire hydrants.

**Sewer**

The Alternative 2 PDP proposes construction of an approximately 4,800-foot long four inch diameter sanitary sewer force main in Paradise Drive from Forest Glen Court to approximately 800 feet south of the southern project boundary, where it would connect with existing sewer lines maintained by Sanitary District No. 5. All sewage from the project would be conveyed to this sanitary sewer force main in Paradise Drive. The PDP does not propose to utilize existing sanitary sewer facilities located in the Hill Haven neighborhood.

In addition, a network of sanitary sewer force mains of varying diameters would be constructed within the site to serve the project site.

No provision has been provided to provide sanitary sewer to the Remainder Lot.

**Drainage**

The PDP includes a Grading and Drainage Plan 18 plus a Stormwater Control Plan. 19 The proposed drainage plan is intended to detain increases in storm water runoff on-site so there would be no increase in peak period storm water flows from the project for events greater than the ten-year storm. The Grading Plan proposes the construction of roads with curb and gutter systems that would direct the bulk of impervious surface runoff to catch basins leading to detention facilities. Each detention facility would be designed to maintain pre-project ten-year peak flow rates under post-project land use conditions for the ten-year to 100-year design rainstorms. Facility storage capacities would also contain enough volume to store the post-project increase in runoff volume during the 100-year design

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18 *Town of Tiburon’s 32 Units LDA, Grading Plan, Easton Point Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C1A, and C-1B, op. cit.*

19 *Town of Tiburon’s 32 Units LDA, Stormwater Control Plan, Easton Point Master Plan / Precise Development Plan / Tentative Map, Sheet C-2, op. cit.*
6.0 Alternatives to the Proposed Project

2008 Easton Point Residential Development Draft EIR

rainstorm. The Drainage Report\(^{20}\) provides documentation for design of these “roadway detention systems” which would also handle impervious surface runoff from a small number of residential lots. Included in the Drainage Report is a detention facility sizing routine for future home development. The design of residential detention systems would occur during the Design Review process for each lot. Discharge for the detention facilities would be directed to a level spreader, infiltration trench, bubble-up box, or rip rap pad. Where appropriate site conditions exist, detention facility discharge would outlet onto hillslopes for further treatment via vegetation and soil filtering, prior to reaching site drainageways. In instances where geotechnical concerns would not permit release of stormwater onto hillslopes, detention facility discharge would be conveyed to site drainageways. Drainageway flows would be conveyed to culvert crossings under Paradise Drive and would continue downslope and off-site toward their respective outlets in North San Francisco Bay. None of the existing Paradise Drive culverts handling runoff from the project site are proposed for replacement as part of Alternative 2.

The pre-project and post-project watershed boundaries depicted in the Alternative 2 Drainage Report appendices indicate that there would be minor locations of cross-watershed runoff transfers. The cross-watershed transfers would be a result of the proposed roadway grading, rather than hillslope grading. Catch basins and outfalls would not be spaced to capture and release stormwater within existing watersheds. Rather, they would be spaced such that after site grading, rainfall that falls within an existing watershed boundary may be conveyed as surface flow across a watershed boundary prior to being collected in a catch basin and directed to a hillslope or drainageway outfall.

Site roadway drainage design also includes the incorporation of filtration systems at each catch basin. The filtration systems look like tradition stormwater catch basins. These systems are an at-the-source treatment strategy, also known as low-impact development (LID) technology, designed for high pollutant removal efficiency via the use of a plant/soil/microbe treatment media. Lot roof and impervious surface runoff would also be treated using LID techniques by directing runoff to bioretention areas for treatment prior to entering detention vaults or being released into site drainageways. In addition, landscaping would be designed to minimize the use of herbicides and pesticides.

**Erosion Control**

The Alternative 2 Stormwater Control Plan presents locations of best management practices (BMPs) for erosion control. The Stormwater Control Plan shows the locations of storm drain inlet protection, silt control devices and jute netting for slope protection, and also includes notes describing additional means of protecting water quality by use of LID measures.

**LANDSLIDE REPAIR**

The project site is mapped as being underlain by 28 landslides (Landslides 1 through 23, 26, 27, 38 through 40). Exhibit 3.0-9 shows the location of the landslides on the project site.

As a part of the preparation of the preliminary geotechnical report Miller Pacific Engineering Group (Miller Pacific) prepared a landslide mitigation policy for Alternative 2.\textsuperscript{21} This policy is described below:

Landslides that have a higher potential to affect existing or proposed improvements (Risk Level A landslides) will be improved or repaired. Portions of Risk Level A landslides or debris flow source areas within 100 feet of a residential building envelope or planned public improvement will be repaired. Landslide improvement (i.e. diversion structure, protective barriers and/or subsurface drainage) will be provided for landslide flow paths that cross the residential building envelope, or portions of Risk Level A landslides that could potentially impact exiting off-site public improvements (i.e. Paradise Drive). Landslides with a lower potential to affect existing or proposed improvements (Risk Level B landslides) will be avoided or improved. Risk Level B landslides include active, dormant, or potential landslide areas on the property that do not have the potential to significantly damage property or improvements within or outside the property. In most instances, Risk Level B landslides are located in proposed undeveloped or open space areas.

**Landslide Repair** – Miller Pacific’s proposed landslide repair program would improve the stability of portions of landslides within 100 feet of the residential building envelope and proposed public improvements such that the calculated factor of safety\textsuperscript{22} is at least 1.5 for static conditions and greater than 1.0 for pseudo-static (seismic) conditions. The improved stability may be accomplished by various methods including: (1) excavation of unstable material, installation of subsurface drainage and construction of a compacted earth fill buttress; (2) design and construction of retaining structures; (3) de-watering with subsurface drainage; (4) removal of the entire unstable landslide mass; or (5) other methods acceptable to Marin County. Within a potential debris flow path, provide a protective catchment structure to catch or slow a debris flow and reduce the potential to significantly impact building sites or off-site improvements.

**Landslide Avoidance** - Requires locating structures and improvements an adequate distance from an existing landslide so that any future movement of the landslide would not likely affect the structures or improvements.

**Landslide Improvement** - Maintain or improve the stability of portions of existing landslides more than 100 feet from the proposed residential building envelopes and on-site public improvements. Improvement also includes efforts to maintain or improve stability of portions of landslides within 100 feet of off-site public improvements. Improvement may include subsurface drainage or construction of protective structures below the landslide and within a potential debris flow path to provide a reasonable level of additional protection for existing public improvements (i.e. Paradise Drive).

In general, the project’s geotechnical consultant proposes three main methods of mitigation for the site landslides: use of subdrains, pier and grade beams, and debris fences.


\textsuperscript{22} The factor of safety is defined as the ratio of the resisting forces to the driving forces. Slopes with a factor of safety less than 1.0 are unstable. The higher the factor of safety, the more stable the slope. For pseudo-static analyses, the ground acceleration determined from deterministic methods or the probabilistic ground acceleration that corresponds with a 10 percent chance of being exceeded in 50 years.
**GRADING**

*Alternative 2* grading is intended to prepare the project site for residential development by installing roadways and utilities and repairing landslides and unstable areas. The *Alternative 2* PDP includes a Grading Plan for the roadways and utility installation. The applicant also has prepared approximate grading quantities for the proposed landslide stabilization under *Alternative 2*. A conceptual grading plan has been prepared for each of the 31 proposed lots and the Remainder Lot. The grading plans are based on the building footprints shown on the *Alternative 2* Master Plan site plan.

**Exhibit 6.0-7** provides a summary of the volume of excavation and fill operations for the proposed roadways and utility installation, landslide stabilization, and individual lot grading. **Exhibit 6.0-8** provides a summary of the lot grading quantities based on the conceptual grading plans for each of the 31 proposed lots and the Remainder Lot.

**Exhibit 6.0-7**

*Estimated Amounts of Grading Quantities – Alternative 2*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cubic Yards of:</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Cut</td>
<td>Fill</td>
<td>Import (Export)</td>
</tr>
<tr>
<td>Road Grading</td>
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<td>(5,500)</td>
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<tr>
<td>Utility Installation</td>
<td>2,550</td>
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</tr>
<tr>
<td>Hiking Trail</td>
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<td>(1,850)</td>
</tr>
<tr>
<td><strong>Subtotal - Grading &amp; Utilities</strong></td>
<td>15,550</td>
<td>4,300</td>
<td>(11,250)</td>
</tr>
<tr>
<td>Landslide Stabilization - 10% R&amp;R</td>
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<td>4,566</td>
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<tr>
<td>Landslide Stabilization - Other</td>
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<td><strong>Subtotal - Landslide Stabilization</strong></td>
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<td><strong>41,497</strong></td>
<td><strong>25,046</strong></td>
<td><strong>(16,451)</strong></td>
</tr>
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</table>


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23 **Town of Tiburon’s 32 Units LDA, Grading Plan, Easton Point Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C1A, and C-1B, op. cit.**


### Exhibit 6.0-8
#### Conceptual Lot Grading Study – Alternative 2

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Cut Qty (Cubic Yds)</th>
<th>Fill Qty (Cubic Yds)</th>
<th>Export (Cubic Yds)</th>
<th>Import (Cubic Yds)</th>
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<td><strong>Totals</strong></td>
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<td><strong>16,180</strong></td>
<td><strong>15,680</strong></td>
<td><strong>7,490</strong></td>
</tr>
</tbody>
</table>

The applicant estimates that the grading necessary for site development under *Alternative 2* (roads, utility installation and the hiking trails) would result in 15,550 cubic yards of cut material and the need for 4,300 cubic yards of fill material. Thus grading for the roads, utility installation, and hiking trails would result in an excess of 11,250 cubic yards.

The applicant’s estimate of *Alternative 2* grading quantities needed for removal and recompack of slide debris, to complete conceptual landslide stabilization, would be approximately 47,238 cubic yards of material. The applicant estimates that the landslide stabilization would result in 1,577 cubic yards of cut and the need for 4,566 cubic yards of fill material. Thus landslide stabilization would result in the need for 2,989 cubic yards of fill material. It is estimated, therefore, that site development (road, utility installation, hiking trail, and landslide stabilization) would generate 8,261 cubic yards of cut material. Lot 5, or a suitable alternative lot approved by the County, has been identified for both construction staging and the storage of excess materials. The material would be available for future development on individual lots.

The applicant estimates that the development of the 31 individual lots plus the remainder lot would result in 24,370 cubic yards of cut and the need for 16,180 cubic yards of fill material. This would result in the need to export 8,190 yards of fill material.

**RETAINING WALLS**

As a part of the on-site road construction it would be necessary to construct several retaining walls. Wall heights and lengths would vary as needed. Downhill walls over 2.5 feet in height may require guardrails or fencing.  

Individual lot development would likely require construction of retaining walls. Such walls may be a continuation of the road walls. In order to facilitate this it is proposed to construct a soldier pile wall for each of the driveway cuts. These walls would be removed once the driveway is connected to the road.

**IMPLEMENTATION AND PHASING**

It is assumed that the Construction Management Plan prepared for the proposed project would be the same under *Alternative 2*. If approved by Marin County, the applicant would construct roadway extensions and install infrastructure. On-site project elements to be implemented by the applicant would involve grading and paving for roads, construction of retaining walls, clearing vegetation,  

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26 The estimates for lot grading are based exclusively on the conceptual grading plans. Because each home would be individually designed and engineered, the actual amount of cut and fill for lot development would change in accordance with the final home plans.

27 This refers to retaining walls that would be holding up the road with a drop-off from the road to the grade below. The Building Code requires that any wall over 30 inches must have a guard rail or other protective measure to prevent anyone from falling over the wall.

28 *Construction Management Plan, Easton Point – Project Narrative*, applicant, 2008, Revision 2 in Response to Comments, received by Marin County CDA 3-30-2009.
trenching, installing all utilities (including conduits, pipelines, pump stations, and the 180,000-gallon water tank), re-planting grasslands and trees, and cleaning up the site.

Construction would occur in two sequential or overlapping phases.

- Phase One would include construction of Forest Glen Court and the realigned water line. The construction access road, retaining walls, and paving would occur in this phase. The new MMWD water tank would also be constructed.

- Phase Two would include the clearing, grubbing, grading, landslide repair, subdivision road extensions, utility placement (including installation of pipelines, drop inlets, fire hydrants, electric and cable utility infrastructure) for lots adjacent to the Hill Haven neighborhood. Drainage and utility extensions would also be constructed in this phase.

During Phase One cut material from the lower site that would be necessary for lot development on the upper site would be stock piled on-site. Excess material that would be unnecessary for future home construction would be hauled off site during this phase. This would permit subsequent home development on the site to have required fill available onsite, without additional import.

The PDP includes the development of a construction access road from the terminus of Forest Glen Court to the terminus of Mt. Tiburon Court. The construction access road would be ten feet wide with turnouts and paved with grooved concrete. The construction access road would be the primary access to the site for construction vehicles, including earth moving, construction materials, and work crews.

Applicant-initiated construction activities are described below. The approximate duration and estimated number of construction workers on site during each activity would be similar to the proposed project (see Exhibit 3.0-12 for anticipated duration and number of worker for the proposed project).

Task 1 Site Preparation would involve realignment of the existing MMWD water tank road and replacement of the 12 inch water main, to follow the Forest Glen Drive alignment. This task would include grading lots to provide staging area to place a construction trailer, parking for construction vehicle, and material storage, as follows:

- Construction access road and Parcel C (water tank) – Construction staging would be located off the existing paved MMWD water tank access road in the general location of Lots 25 and 34.

- All Upper Lots – Located along the existing fire road and along the new roadway leading to the proposed water tank site, with Lots 20 and 24 to be used for interim storage of cut necessary for individual lot development.

- Lots 21 through 23 – Staging would occur within the individual lots’ boundaries or on-site at the end of Spanish Trail.

- Lots 25 through 34 – Staging would occur within the individual lots’ boundaries or in the general locations of Lots 25 and 34.

Task 2 Grading would include cut and fill operations for roads, retaining walls, landslide repairs, and utility trenching. Grading would involve operation of bulldozers, compactors, motor graders, scrapers, a water truck and transportation for workers. The contractor would define the limits of grading, install
construction barriers around sensitive trees and vegetation to be avoided, and remove vegetation where construction is planned.

Task 3 Utilities would involve installation of the new MMWD water tank, pumps, pipelines, conduits, and drainage improvements.

Task 4 Road Paving would involve building retaining walls, installing curbs, gutters and storm water drainage drop inlets, and paving roadways.

Task 5 would involve implementation of the proposed site enhancement measures (planting grasslands, tree replacement, etc.) and cleaning up the construction sites.

The Construction Management Plan includes specific measures to mitigate potential construction impacts to existing neighbors and to protect public safety. Included in the plan is the designation of a disturbance coordinator, traffic control measures, noise control measures, air quality control measures, and water quality control measures.

Analysis of the 32-Unit Lower Development Alternative (Alternative 2)

LAND USE AND PLANNING

Alternative 2 would preserve more area known to have Marin dwarf flax and Serpentine reed grass than the proposed project. Also, with Alternative 2’s reconfiguration of lots adjacent to Old St. Hilary’s Open Space Preserve (Lots 1 thru 8), it is less likely that irrigation runoff from this area would impact rare plants that are known to occur downhill from the project site within Old St. Hilary’s Open Space (the potential for this impact is discussed with Impact 5.6-1 Impacts to Special Status Plants). However, Alternative 2 would preserve 11.31 acres less oak woodland habitat than the proposed project. This results in a preservation:loss ratio of only 2:1 for woodland habitat, as opposed to a preservation:loss ratio of 3:1, under the proposed project. This oak woodland habitat may provide foraging and dispersal habitat for the California red-legged frog (CRLF). Furthermore Alternative 2 would remove 238 more trees than the proposed project. Many of these trees would be considered ordinance-sized trees pursuant to the County’s Native Tree Preservation ordinance. Therefore Alternative 2 would increase the project’s inconsistency with policies intended to protect habitat for special-status species and tree resources (see Marin Countywide Plan Policies BIO-1.1 and BIO-1.3, Paradise Visioning Plan Goal I-3, Goal II-2, and Marin County Code Section 22.16.030 (L)). In terms of limiting development impacts (Marin Countywide Plan Policy BIO-2.2), Alternative 2 would decrease impacts on special status plant species while increasing impacts on oak woodland habitat, ordinance-sized trees, and CRLF habitat. Alternative 2, therefore would remain potentially inconsistent with these policies unless recommend mitigation measures are implemented. As with the proposed project it may not be feasible to implement mitigation measures under Alternative 2.

Alternative 2 would result in fewer residential lots and less impervious surfaces throughout the project site. Alternative 2 would also reduce the amount of area potentially devoted to irrigated landscape and utilize fewer subdrain systems to dewater landslides located on the project site. However, like the proposed project Alternative 2 would be inconsistent with policies intended to promote healthy watersheds and water quality because of the physical changes the project would have on the site’s hydrology (see Marin Countywide Plan Policies WR-1.1, WR-1.3, and WR-1.4).
Unlike the proposed project, *Alternative 2* includes the provision of pedestrian trails on the project site and is, therefore, more consistent with policies intended to promote the creation of and sustain trails (see *Marin Countywide Plan Goal TRL-1* and *Policies TRL-1.2, TRL-1.4*).

*Alternative 2*, like the proposed project, would require extensive amounts of grading in preparation for the development of the project site and landslide remediation. Therefore *Alternative 2* would still be inconsistent with various public policies intended to reduce hillside grading and maintain natural topography such as *Marin Countywide Plan Policy EH-3.2*, *Marin County Code Section 22.16.030(L)*, *Marin County Single Family Residential Design Guidelines A-1.4*. However the degree of inconsistency would be less with *Alternative 2* than with the proposed project.

*Alternative 2* would feature fewer residential lots developed along visually prominent ridgelines, however, it would still be inconsistent with policies that call for the preservation of ridgelines and other scenic resources (see *Marin Countywide Plan Goal DES-4* and *Policy DES-4.1*, *Marin County Code Section 22.16.030 (f)*). The residential building envelope for the Remainder Lot, however, would be within the area designated a visually prominent ridgeline (see Ridgeline J on *Exhibit 4.0-1*). This reduction of density at the higher elevations would also increase the project’s consistency with *Marin Countywide Plan Policy CD-1.3*, which encourages residential densities be calculated at the lower end when located within the Ridge and Upland Greenbelt area.

Building square footage for *Alternative 2* would be calculated according to the method set forth in the Tiburon Zoning Code as of October 26, 2009, which is very similar to the method contained in the Marin County Development code. There are subtle differences between the two codes regarding the exclusion of garages, accessory structures, basements, and attics. However both codes consider any floor area that could easily be converted to habitable space as building square footage. While both codes exclude some garage area, it is stipulated in the Draft Development Agreement for *Alternative 2* that garages, carports, and accessory building shall be counted towards the building square footage.

**TRANSPORTATION**

Similar to the proposed project, the *Alternative 2* site plan is comprised of separate development areas and corresponding access which would affect the off-site road network, as follows:

- Existing Old Tiburon and Hill Haven neighborhood streets -- Solano Street, Centro East Street, Centro West Street, Diviso Street, Vistazo East Street, Ridge Road, and Mountain View Drive would provide access to Lot 1, and Ridge Road would provide access to Lots 2 through 17.

- Paradise Drive would provide direct access to Lots 18 through 21 via a new driveway intersection near the Mar East neighborhood.

- Paradise Drive would provide indirect access to Lots 22 through 31 via Forest Glen Court (proposed as a newly built road to replace the existing Marin Municipal Water District (MMWD) Paradise Water Tank service road).

- Paradise Drive would provide indirect access to the Remainder Lot via a new driveway intersection located about 1,300 feet north of the proposed Forest Glen Court.

Characteristics of these local and regional transportation links are summarized in *Section 5.1 Transportation*, and shown in *Exhibits 5.1-1 and 5.1-2*. 
**ALTERNATIVE 2 TRAFFIC GENERATION**

Application of the same trip rate utilized for the proposed project (i.e., the averaged trip rate from the two surveyed Tiburon neighborhoods) was applied to *Alternative 2*. The 32 single-family detached houses proposed in *Alternative 2* would generate the trips shown in Exhibit 6.0-9: 19 inbound and 18 outbound trips would be expected during the AM peak hour, and 16 inbound and 23 outbound trips would be expected during the PM peak hour.

**Exhibit 6.0-9**

**Alternative 2 Project Trip Generation**

<table>
<thead>
<tr>
<th>Road</th>
<th># of Units</th>
<th>AM Peak Hour Trips</th>
<th>PM Peak Hour Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>In</td>
<td>Out</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rate</td>
<td>Volume</td>
</tr>
<tr>
<td>Mountain View</td>
<td>1</td>
<td>0.58</td>
<td>1</td>
</tr>
<tr>
<td>Ridge Road</td>
<td>16</td>
<td>0.58</td>
<td>9</td>
</tr>
<tr>
<td>Lots 18-21</td>
<td>4</td>
<td>0.58</td>
<td>2</td>
</tr>
<tr>
<td>Forest Glen Court</td>
<td>10</td>
<td>0.58</td>
<td>6</td>
</tr>
<tr>
<td>Remainder Lot</td>
<td>1</td>
<td>0.58</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td><strong>19</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

*a* Trip Rate Sources:

Surveys conducted in two Tiburon neighborhoods – upper reaches of Reed Ranch Road and upper reaches of Gilmartin Drive (after #120) by Crane Transportation Group for the Easton Point EIR Transportation Analysis, May, 2009.

*b* The traffic volume from each *Alternative 2* project development area has been rounded up or down to the nearest 1.0, unless the volume is less than 1.0, in which case the volume is rounded up to 1.0.

Source: Crane Transportation Group

**ALTERNATIVE 2 TRIP DISTRIBUTION**

The same pattern of distribution was applied to trips generated by *Alternative 2* as was applied to the proposed project. **Exhibits 6.0-10 through 6.0-13** show the *Alternative 2* increment of traffic on the road system for both the AM and PM peak hours.

**Exhibit 6.0-14** shows *Alternative 2*’s additions to the AM and PM peak hour total approach volumes on Tiburon Boulevard-Paradise Drive at three intersections:

- In the project site vicinity just south of (proposed) Forest Glen Court.
- In the downtown just east of Beach Road.
- At the west end of town, just east of the Redwood Highway Frontage Road near U.S. 101.
Exhibit 6.0-10
Alternative 2 - AM Peak Hour Project Increment Western Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-11
Alternative 2 - AM Peak Hour Project Increment Eastern Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-13
Alternative 2 - PM Peak Hour Project Increment Eastern Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-14
Alternative 2 Project Traffic Added to Existing Volumes At Select Intersections

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Existing Intersection Total Approach Volumes</th>
<th>Existing + Alt 2 Intersection Total Approach Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM Peak Hour</td>
<td>PM Peak Hour</td>
</tr>
<tr>
<td></td>
<td>Volume % Increase</td>
<td>Volume % Increase</td>
</tr>
<tr>
<td>Forest Glen Court</td>
<td>21</td>
<td>45</td>
</tr>
<tr>
<td>Beach/Tiburon/Paradise</td>
<td>890</td>
<td>1,140</td>
</tr>
<tr>
<td>Redwood Highway Frontage Rd./Tiburon Blvd</td>
<td>3,780</td>
<td>4,380</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

TRANSPORTATION

Impact 6.1-1 Existing-Plus-Alternative 2 Impacts on Study Intersections

Alternative 2-generated trips were added to existing weekday AM and PM peak hour volumes to obtain existing-plus-Alternative 2 volumes. The resulting existing-plus-Alternative 2 traffic volumes are shown in Exhibits 6.0-15 through 6.0-18.

Exhibits 6.0-19 and 6.0-20 present the existing-plus-Alternative 2 levels of service at all study intersections. Alternative 2 traffic added to existing volumes on Tiburon Boulevard would result in the following:

- At signalized intersections currently operating acceptably, the addition of Alternative 2 traffic would not result in an unacceptable level of service operation.

- At the one unsignalized intersection with side street left turns currently operating unacceptably in both the AM and PM peak hour (Reed Ranch Road / Tiburon Boulevard), the addition of Alternative 2 traffic volumes would not result in meeting the signal warrant #3 criteria levels.

Exhibit 6.0-21 shows the results of signal warrant evaluation.

These impacts would be the same as for the proposed project.

Mitigation Measure 6.1-1 No mitigation would be required.
Exhibit 6.0-15
Existing plus Alternative 2 - AM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-16
Existing plus Alternative 2 - AM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-17
Existing plus Alternative 2 - PM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-18
Existing plus Alternative 2 - PM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2010
### Exhibit 6.0-19
Intersection Level of Service -- AM Peak Hour

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Without Alt 2</td>
</tr>
<tr>
<td>1. Southbound Highway 101 Off-</td>
<td>Signal</td>
<td>C- 20.6 \textsuperscript{a}</td>
</tr>
<tr>
<td>Ramp / East Blithedale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Redwood Highway Frontage Road /</td>
<td>Signal</td>
<td>C- 22.5 \textsuperscript{a}</td>
</tr>
<tr>
<td>Tiburon Boulevard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
<td>C-22.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Reed Ranch Road / Tiburon</td>
<td>Stop Sign</td>
<td>F*-B-12.2 \textsuperscript{b}</td>
</tr>
<tr>
<td>Boulevard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Trestle Glen / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-14.9 \textsuperscript{a}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Avenida Miraflores / Tiburon</td>
<td>Signal</td>
<td>B-18.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-12.0 \textsuperscript{a}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Trestle Glen/ Paradise Drive</td>
<td>Stop Sign</td>
<td>B-11.4/A-7.6 \textsuperscript{c}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. San Rafael Avenue / Tiburon</td>
<td>Signal</td>
<td>B-10.7 \textsuperscript{a}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.1 \textsuperscript{a}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Mar West Street (West) /</td>
<td>Stop Sign</td>
<td>C-22.9/C-17.6 \textsuperscript{d}</td>
</tr>
<tr>
<td>Tiburon Boulevard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.6 \textsuperscript{a}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Vistazo Road/ Ridge Road/ St</td>
<td>Stop Sign</td>
<td>A-9.9/A-8.9/A-7.3 \textsuperscript{e}</td>
</tr>
<tr>
<td>Bernard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Mar East Street/ Tiburon</td>
<td>Stop Sign</td>
<td>B-10.4 \textsuperscript{f}</td>
</tr>
<tr>
<td>Boulevard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Forest Glen Court / Paradise</td>
<td>Stop Sign</td>
<td>NA/NA \textsuperscript{g}</td>
</tr>
<tr>
<td>Drive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

\textbf{F*} = Average delay exceeds 3 minutes. \textbf{Bold type} indicates unacceptable level of service.

\begin{itemize}
  \item \textsuperscript{a} Signalized level of service-average vehicle delay (in seconds).
  \item \textsuperscript{b} Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Southbound Reed Ranch Road right-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.
  \item \textsuperscript{c} Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.
  \item \textsuperscript{d} Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.
  \item \textsuperscript{e} Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/ Westbound Vistazo Road approach/Southbound Ridge Road approach.
  \item \textsuperscript{f} Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.
  \item \textsuperscript{g} Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.
\end{itemize}
### Exhibit 6.0-20
Intersection Level of Service – PM Peak Hour

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Without Alt 2</td>
</tr>
<tr>
<td>1. Southbound Highway 101 Off-Ramp / East Blithedale</td>
<td>Signal</td>
<td>C- 21.1(^a)</td>
</tr>
<tr>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>C- 33.6(^a)</td>
</tr>
<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.8(^a)</td>
</tr>
<tr>
<td>4. Reed Ranch Road / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>F-96.5/B-12.0(^b)</td>
</tr>
<tr>
<td>5. Trestle Glen / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-14.7(^a)</td>
</tr>
<tr>
<td>6. Avenida Miraflores / Tiburon</td>
<td>Signal</td>
<td>B-14.9(^a)</td>
</tr>
<tr>
<td>7. Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>A-8.3(^a)</td>
</tr>
<tr>
<td>8. Trestle Glen / Paradise Drive</td>
<td>Stop Sign</td>
<td>B-11.8/ A-7.6(^c)</td>
</tr>
<tr>
<td>9. San Rafael Avenue / Tiburon</td>
<td>Signal</td>
<td>A-9.7(^a)</td>
</tr>
<tr>
<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-13.0(^a)</td>
</tr>
<tr>
<td>11. Mar West Street (West) / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>C-24.9/ D-28.8(^d)</td>
</tr>
<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-18.5(^a)</td>
</tr>
<tr>
<td>13. Vistazo Road / Ridge Road / St Bernard</td>
<td>Stop Sign</td>
<td>A-9.6/A-9.0/ A-7.3(^e)</td>
</tr>
<tr>
<td>14. Mar East Street / Tiburon Boulevard</td>
<td>Stop Sign</td>
<td>B-10.8(^f)</td>
</tr>
<tr>
<td>15. Forest Glen Court / Paradise Drive</td>
<td>Stop Sign</td>
<td>NA/NA(^g)</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009.

\(F^*\) = Average delay exceeds 3 minutes. **Bold type** indicates unacceptable level of service.

\(a\) Signalized level of service-average vehicle delay (in seconds).

\(b\) Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Southbound Reed Ranch Road right-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.

\(c\) Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.

\(d\) Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.

\(e\) Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/ Westbound Vistazo Road approach/Southbound Ridge Road approach.

\(f\) Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.

\(g\) Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.
**Exhibit 6.0-21**

**Signal Warrants**

<table>
<thead>
<tr>
<th>Location</th>
<th>AM Without Alternative 2</th>
<th>PM Without Alternative 2</th>
<th>AM With Alternative 2</th>
<th>PM With Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reed Ranch Road/Tiburon Boulevard</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Mar West Street/Tiburon Boulevard</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

**Impact 6.1-2  Cumulative Buildout-Plus-Alternative 2 Impacts to Study Intersections**

Cumulative-plus-Alternative 2 conditions would increase peak hour traffic volumes at all study intersections. With planned improvements, all but three study intersections would operate acceptably, with or without the Alternative 2, during the AM and PM peak hours. The signalized Avenida Miraflores / Tiburon Boulevard intersection would operate unacceptably at LOS E during the weekday AM peak hour, the signalized Rock Hill Drive / Tiburon Boulevard intersection would operate unacceptably at LOS E during the weekday PM peak hour, and the unsignalized Reed Ranch Road southbound left turn to Tiburon Boulevard would operate unacceptably at LOS F during the AM and PM peak hours. No improvements are planned for these intersections. The addition of Alternative 2 traffic would increase the average delay at the Avenida Miraflores and Rock Hill Drive intersections, and this delay would be cumulatively considerable.

At the Reed Ranch Road / Tiburon Boulevard intersection, where signal warrants would not be met even with buildout of the Tiburon General Plan plus Alternative 2 traffic volumes, southbound left turns from Reed Ranch Road would continue to operate at an unacceptable LOS F. The flow of traffic on Tiburon Boulevard, however, would remain at an acceptable LOS C. Alternative 2 traffic would contribute only to through traffic on Tiburon Boulevard, which, with Alternative 2 traffic added, would have acceptable LOS C operation. Per Marin County and Transportation Authority of Marin significance standards, the Alternative 2’s impact at this intersection would not be cumulatively considerable.

These impacts would be the same as for the proposed project.

Cumulative traffic volumes including Alternative 2-generated trips are shown on Exhibits 6.0-22 through 6.0-25. Exhibits 6.0-26 and 6.0-27 show intersection LOS at study intersections under cumulative conditions, with and without traffic from Alternative 2.

Exhibit 6.0-28 presents the signal warrant #3 evaluation for unsignalized intersections, and shows that with cumulative volumes signal warrant criteria would be met at the Mar West / Tiburon Boulevard intersection during the PM peak hour. Warrant #3 criteria would not be met at the Reed Ranch Road / Tiburon Boulevard intersection, and signalization would not be considered until volume warrants are met.

**Mitigation Measure 6.1-2** Mitigation of cumulative traffic impacts to study intersections would require payment of a prorated share of planned improvements and payment in full for mitigation of the unplanned improvements.
Exhibit 6.0-22
2020 Cumulative plus Alternative 2 - AM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-23
2020 Cumulative plus Alternative 2 - AM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-24
2020 Cumulative plus Alternative 2 - PM Peak Hour Volumes Western Tiburon

Source: Crane Transportation Group, 2010
Exhibit 6.0-25
2020 Cumulative plus Alternative 2 - PM Peak Hour Volumes Eastern Tiburon

Source: Crane Transportation Group, 2010
### Exhibit 6.0-26
#### Intersection Level of Service -- AM Peak Hour

<table>
<thead>
<tr>
<th>Intersection Control</th>
<th>Intersection Level of Service</th>
<th>Without Alt 2</th>
<th>With Alt 2</th>
<th>Without Alt 2</th>
<th>With Alt 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Southbound Highway 101 Off-Ramp / East Blithedale</td>
<td>Signal</td>
<td>C-20.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-20.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-22.1</td>
<td>C-22.2</td>
</tr>
<tr>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>C-22.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-22.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-34.9</td>
<td>D-35.8</td>
</tr>
<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
<td>C-22.3</td>
<td>C-22.5</td>
<td>C-27.2</td>
<td>C-27.7</td>
</tr>
<tr>
<td>4. Reed Ranch Road / Tiburon Boulevard (existing stop sign control)</td>
<td>Stop Sign</td>
<td>F*/B-12.2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F*/B-12.3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F*/C-15.8</td>
<td>F*/C-16.0</td>
</tr>
<tr>
<td>5. Trestle Glen / Tiburon Boulevard (existing configuration)</td>
<td>Signal</td>
<td>B-14.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>E-62.4</td>
<td>E-65.3</td>
</tr>
<tr>
<td>Trestle Glen / Tiburon Boulevard (planned configuration)</td>
<td>Planned Configuration</td>
<td></td>
<td></td>
<td>D-46.5&lt;sup&gt;c&lt;/sup&gt;</td>
<td>D-47.9&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>6. Avenida Miraflores / Tiburon</td>
<td>Signal</td>
<td>B-18.3</td>
<td>B-18.9</td>
<td>E-64.8</td>
<td>E-68.9</td>
</tr>
<tr>
<td>7. Rock Hill / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-12.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-12.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>D-50.9</td>
<td>D-53.2</td>
</tr>
<tr>
<td>8. Trestle Glen/ Paradise Drive</td>
<td>Stop Sign</td>
<td>B-11.4/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>B-11.5/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>B-13.0/A-7.8</td>
<td>B-13.1/A-7.8</td>
</tr>
<tr>
<td>9. San Rafael Avenue / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-10.7&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>B-14.9</td>
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<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.1&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>B-16.1</td>
<td>B-16.3</td>
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<tr>
<td>11. Mar West Street (West) / Tiburon Boulevard (existing stop sign control)</td>
<td>Stop Sign</td>
<td>C-22.9/C-17.6&lt;sup&gt;d&lt;/sup&gt;</td>
<td>C-24.0/C-18.4&lt;sup&gt;d&lt;/sup&gt;</td>
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<td>F-51.2/D-26.5</td>
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<td>B-15.6&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-16.9</td>
<td>B-17.3</td>
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</table>
### 6.0 Alternatives to the Proposed Project

**2008 Easton Point Residential Development Draft EIR**

<table>
<thead>
<tr>
<th>Intersection Control</th>
<th>Intersection</th>
<th>Without Alt 2</th>
<th>With Alt 2</th>
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<th>Without Alt 2</th>
<th>With Alt 2</th>
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<td></td>
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</tr>
<tr>
<td>14. Mar East Street/ Tiburon Boulevard</td>
<td>Stop Sign</td>
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<td>B-10.7*</td>
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<td>B-11.5</td>
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<td>15. Forest Glen Court / Paradise Drive</td>
<td>Stop Sign</td>
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<td>A-8.5/A-7.2*</td>
<td></td>
<td>A-8.6/A-7.3</td>
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</table>

Source: Crane Transportation Group, 2009

F* = Average delay exceeds 3 minutes. **Bold type** indicates unacceptable level of service. *Italics indicate planned improvements per Tiburon General Plan 2020.*

- Signalized level of service-average vehicle delay (in seconds).
- Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Southbound Reed Ranch Road right-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.
- Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.
- Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.
- Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/ Westbound Vistazo Road approach/Southbound Ridge Road approach.
- Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.
- Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.
### Exhibit 6.0-27

**Intersection Level of Service -- PM Peak Hour**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing</th>
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<td></td>
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<td>With Alt 2</td>
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<td>C-21.1&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>2. Redwood Highway Frontage Road / Tiburon Boulevard (existing configuration)</td>
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<td>C-33.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-34.0&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Redwood Highway Frontage Road / Tiburon Boulevard (planned configuration)</td>
<td>Signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Blackfield / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-15.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>4. Reed Ranch Road / Tiburon Boulevard (existing stop sign control)</td>
<td>Stop Sign</td>
<td>F-96.5/B-12.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F-102.7/B-12.2&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>5. Trestle Glen / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-14.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>B-15.5&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td><strong>Trestle Glen / Tiburon Boulevard (planned configuration)</strong></td>
<td>Planned Configuration</td>
<td></td>
<td></td>
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<tr>
<td>6. Avenida Miraflores / Tiburon</td>
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<td>B-15.4&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>7. Rock Hill / Tiburon Boulevard</td>
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<td>A-8.5&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
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<td>B-11.8/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>B-11.8/A-7.6&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td>9. San Rafael Avenue / Tiburon Boulevard</td>
<td>Signal</td>
<td>A-9.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>A-9.8&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>10. Lyford Drive / Tiburon Boulevard</td>
<td>Signal</td>
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<td>B-13.1&lt;sup&gt;a&lt;/sup&gt;</td>
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### 6.0 Alternatives to the Proposed Project

#### 2008 Easton Point Residential Development Draft EIR

### Existing Cumulative (2020)

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
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<td>Mar West Street (West) / Tiburon Boulevard (planned signal control)</td>
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<td></td>
<td>C-22.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>C-23.5&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>12. Beach Road / Tiburon Boulevard</td>
<td>Signal</td>
<td>B-18.5&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>C-21.2</td>
<td>C-21.8</td>
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<tr>
<td>13. Vistazo Road/ Ridge Road/ St Bernard</td>
<td>Stop Sign</td>
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<td>B-9.7/A-9.0/ A-7.3&lt;sup&gt;e&lt;/sup&gt;</td>
<td>B-10.0/A-9.1/ A-7.3&lt;sup&gt;e&lt;/sup&gt;</td>
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<tr>
<td>14. Mar East Street/ Tiburon Boulevard</td>
<td>Stop Sign</td>
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<td>B-12.1</td>
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<td>15. Forest Glen Court / Paradise Drive</td>
<td>Stop Sign</td>
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<td>A-8.9/NA&lt;sup&gt;g&lt;/sup&gt;</td>
<td>A-9.1/NA</td>
<td>NA/NA&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

**F**<sup>*</sup> = Average delay exceeds 3 minutes. **Bold type** indicates unacceptable level of service. **Italic** indicate planned improvements per Tiburon General Plan 2020.

- **a** Signalized level of service-average vehicle delay (in seconds).
- **b** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Southbound Reed Ranch Road left-turn to Tiburon Boulevard / Southbound Reed Ranch Road right-turn to Tiburon Boulevard / Eastbound Tiburon Boulevard left-turn to Reed Ranch Road.
- **c** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Paradise Drive through movement/ Northbound Trestle Glen left turn to Paradise Drive.
- **d** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar West Street approach to Tiburon Boulevard / Southbound Mar West Street left turn to Tiburon Boulevard.
- **e** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Vistazo Road approach/ Westbound Vistazo Road approach/Southbound Ridge Road approach.
- **f** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Northbound Mar East Street approach to Tiburon Boulevard.
- **g** Side street stop sign-controlled level of service-average vehicle delay (in seconds). Eastbound Forest Glen Court (project access driveway) approach to Paradise Drive / Northbound Paradise Drive left-turn to Forest Glen Court.
- **h** Add an exclusive northbound right turn lane to provide one left, one left/through, and one right turn lane. Resultant mitigated signalized level of service-average vehicle delay (in seconds).
- **i** Add a westbound Tiburon Boulevard right turn lane. Resultant mitigated signalized level of service-average vehicle delay (in seconds).
**Exhibit 6.0-28**

**Signal Warrants**

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing Without Alt 2</th>
<th>Existing With Alt 2</th>
<th>Cumulative Without Alt 2</th>
<th>Cumulative With Alt 2</th>
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<td></td>
<td>AM PM</td>
<td>AM PM</td>
<td>AM PM</td>
<td>AM PM</td>
</tr>
<tr>
<td>Reed Ranch Road/Tiburon Boulevard</td>
<td>No No</td>
<td>No No</td>
<td>No No</td>
<td>No No</td>
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<tr>
<td>Mar West Street/Tiburon Boulevard</td>
<td>No No</td>
<td>No No</td>
<td>Yes No</td>
<td>No Yes</td>
</tr>
</tbody>
</table>

Source: Crane Transportation Group, 2009

**Mitigation Measure 6.1-2(a)** The applicant shall pay the *Alternative 2*’s prorated share of planned lane improvements 29 at the Redwood Highway Frontage Road / Tiburon Boulevard intersection and Trestle Glen / Tiburon Boulevard intersection, consistent with traffic mitigation fees to be determined by the Town of Tiburon and supported by the *CWP*. Additionally, the applicant shall pay the *Alternative 2*’s prorated share of planned signalization of the Mar West / Tiburon Boulevard intersection, consistent with traffic mitigation fees to be determined by the Town of Tiburon and supported by the *CWP*. The resulting acceptable LOS is shown in Exhibits 6.0-29 and 6.0-30 for these three intersections.

**Mitigation Measure 6.1-2(b)** The applicant shall pay the *Alternative 2*’s fair share for provision of overlapping phasing for the southbound left turn from both Avenida Miraflores and Rock Hill Drive to Tiburon Boulevard. The fair share calculation shall be done by the Town of Tiburon. Resulting mitigated intersection LOS for these two intersections is shown in Exhibits 6.0-29 and 6.0-30.

**Significance After Mitigation** Implementation of Mitigation Measures 6.1-2(a) and 6.1-2(b) would reduce cumulative impacts to less-than-significant levels. These improvements are feasible, pending approval by Marin County, Caltrans and the Town of Tiburon. With these measures, *Alternative 2* impacts would not be cumulatively considerable significant impacts at these intersections.

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29 Policy basis for mitigation measures: Marin County’s, Sub-regional Transportation Improvement Fees are assessed for new developments to pay their fair share for transportation facilities fees in specific study areas.

The *CWP* Policy TR-1.4 requires that new development pay its fair share of the transportation system impacts, and Policy TR-1.5 requires necessary transportation improvements to be in place, or to otherwise guarantee their timely installation, before or concurrent with new developments.

Implementing Program TR-1.g Determine Appropriate Mitigation specifies “require the preparation of a traffic impact analysis report to identify impacts and mitigation measures for projects that may result in significant traffic impacts.”

Implementing Program TR-1.j Install Highway Improvements, states “work with the Transportation Authority of Marin and Caltrans to carry out physical and operational improvements...”

Consistent with *CWP* policies TR-1.4 and TR-1.5, the Town of Tiburon’s Traffic Mitigation Fee (TMF) Program was reviewed to determine relevant planned projects that would respond to the Countywide policies and implementing programs, specifically, to “identify impacts and mitigation measures for projects that may result in significant traffic impacts,” then “require that new development pay its fair share of the transportation system impacts” and “guarantee their timely installation.”

Marin County has a Public Transportation Facilities Fee ordinance to mitigate cumulative impacts at selected intersections from future projects. The fee is based on the number of new PM peak-hour trips generated by a proposed project.
### Exhibit 6.0-29
**Mitigated Intersection Level of Service -- AM Peak Hour**

<table>
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<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing Without Alt 2</th>
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<th>Cumulative (2020) Without Alt 2</th>
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<tr>
<td>Avenida Miraflores/ Tiburon Boulevard</td>
<td>Signal</td>
<td>N/A</td>
<td>N/A</td>
<td>D-43.3 a</td>
<td>D-48.7 a</td>
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<tr>
<td>Rock Hill/ Tiburon Boulevard</td>
<td>Signal</td>
<td>N/A</td>
<td>N/A</td>
<td>C-24.1 a</td>
<td>C-24.3 a</td>
</tr>
</tbody>
</table>

*a* Provide overlap phasing for southbound right turn. Resultant mitigated signalized level of service-average vehicle delay (in seconds).

Source: Crane Transportation Group, 2009

### Exhibit 6.0-30
**Mitigated Intersection Level of Service -- PM Peak Hour**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Intersection Control</th>
<th>Existing Without Alt 2</th>
<th>With Alt 2</th>
<th>Cumulative (2020) Without Alt 2</th>
<th>With Alt 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avenida Miraflores/ Tiburon Boulevard</td>
<td>Signal</td>
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<td>N/A</td>
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<td>D-45.6 a</td>
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<tr>
<td>Rock Hill/ Tiburon Boulevard</td>
<td>Signal</td>
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<td>N/A</td>
<td>C-30.0 a</td>
<td>C-32.1 a</td>
</tr>
</tbody>
</table>

*a* Provide overlap phasing for southbound right turn. Resultant mitigated signalized level of service-average vehicle delay (in seconds).

Source: Crane Transportation Group, 2009
**Impact 6.1-3  Safety Impact Due to Inadequate Distances Approaching the Unsignalized Intersections of Paradise Drive with Alternative 2 Access Roads**

“Sight distance” refers to the minimum distance that a driver traveling at “critical speeds” (the speed below which 85 percent of the vehicles are traveling) must have to see a vehicle entering the road from a side street or driveway and to be able to stop without colliding with the vehicle.

**Exhibit 6.0-31** shows the minimum sight distance requirements according to vehicle speed and roadway grade, based on American Association of State Highway and Transportation Officials (AASHTO) design standards.  

Visibility for drivers approaching the intersection of Paradise Drive with the proposed driveway to Lots 18 through 21 and the proposed intersection of Forest Glen Court would be subject to the AASHTO standard for stopping sight distance. The Forest Glen Court intersection would, in the opinion of the EIR traffic analyst, result in a potentially unsafe condition. This would be a significant impact.

This impact would be the same as for the proposed project.

The intersection of the driveway proposed to serve the Remainder Lot in Alternative 2 would also be subject to the AASHTO standard for stopping sight distance. The driveway access to the Remainder Lot would be located on the outside of a sharp curve along Paradise Drive. The sight distance for drivers exiting this driveway would be about 190 feet to the north and 225 feet to the south. At observed speeds of 20 to 25 MPH through this sharp curve, the stopping sight distance for a driver on Paradise Drive to see an outbound vehicle would be adequate based on Caltrans standards.

**Exhibit 6.0-31
Minimum Sight Distance Standards**

<table>
<thead>
<tr>
<th>Vehicle Speed (mph)</th>
<th>Stopping Sight Distance (feet)</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Grade</td>
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<tr>
<td>30</td>
<td>200</td>
</tr>
<tr>
<td>35</td>
<td>250</td>
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</table>

Source: AASHTO Geometric Design of Highways and Streets, 2004

**Mitigation Measure 6.1-3** In order to reduce the significant access driveway safety impacts for the Paradise Drive / Forest Glen Court intersection (providing access to Lots 22 through 31), the applicant

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Alternatives to the Proposed Project

shall prepare a right-of-way improvement plan. The improvement shall clearly show that adequate sight distance would be provide and shall include the following measures:

- Improve the Forest Glen Court / Paradise Drive intersection to provide a minimum of 158 feet of sight distance in both directions for outbound vehicles. This would slightly exceed the 150 feet of sight distance, as recommended for the proposed project by the applicant’s traffic engineer, and is used to comply with the stopping site distance standard cited in Exhibit 6.0-31.

- Widen the Paradise Drive road to include four-foot shoulders with minimum 60-foot taper at the proposed Forest Glen Court intersection.

Significance After Mitigation: Implementation of this mitigation measure would provide adequate stopping sight distance for motorists approaching Forest Glen Court, in compliance with the AASHTO recommended sight distance. Based on the prevailing speed of 25 miles per hour, a minimum stopping sight distance of 158 feet would be required in order to comply with the AASHTO standard.

Potential secondary impacts of this mitigation measure would be the same as for the proposed project and are discussed in Section 5.5 Hydrology and Water Quality (see Impact 5.5-2 On-Site Drainage Patterns – On-Site and Off-Site Flooding) and Section 5.6 Biological Resources (see Impacts 5.6-4 Loss of Coast Live Oak Woodland and 5.6-8 Loss of Ordinance-Size Trees).

Mitigation Measure 6.1-3 would allow motorists, bicyclists, and pedestrians exiting Forest Glen Court to view motorists approaching the project entrance at a distance of 158 feet. Implementation of Mitigation Measure 6.1-3 would reduce this impact to a less-than-significant level.

Impact 6.1-4 Impact on Regional Roads

Alternative 2 would generate trips that would travel on two facilities that are designated as routes of regional significance as part of the County Congestion Management Program (CMP): Tiburon Boulevard and U.S. 101. U.S. 101 would experience a significant impact resulting from regional growth, including growth within Tiburon which includes Alternative 2. The impact would be the same as for the proposed project. This would be a significant cumulative impact.

Mitigation Measure 6.1-4 The Marin Countywide Plan Final EIR identifies mitigation measures to reduce impacts on U.S. 101, see Mitigation Measures 4.2-2, 4.2-9, 4.2-10, and 4.2-13. These measures include improved public transportation service countywide, and additional travel lanes on U.S. 101 to provide additional road capacity. Implementation of these measures is outside the sole jurisdiction of Marin County.

Significance After Mitigation: The findings adopted for the Marin Countywide Plan state that the identified mitigation measures are the responsibility of another public agency. Furthermore, although the identified impacts to U.S. 101 can be mitigated they cannot be mitigated to a less-than-significant level. Therefore, this is a significant unavoidable cumulative impact.

31 Findings Pursuant to the California Environmental Quality Act Marin Countywide Plan, adopted by the Marin County Board of Supervisors, November 2007.
Impact 6.1-5  Alternative 2 Impact on Transit

Traffic generated by Alternative 2 would not adversely impact transit operations. Increase in demand for transit generated by Alternative 2 would be met by existing services. This would be a less-than-significant impact.

Mitigation Measure 6.1-5  No mitigation would be required.

Impact 6.1-6  Alternative 2 Impact on Bicycle Facilities and Bicycle Safety Issues

As with the proposed project future residents under Alternative 2 would contribute to the number of bicyclists using Paradise Drive, a narrow and winding roadway that lacks shoulders and can be challenging for inexperienced cyclists. Alternative 2 residents would also add motor vehicle traffic in both directions to the road, which has limited areas for motorists to pass bicyclists given the narrow width and frequent curves. While the impact is not significant alone, the additional increment of motor vehicle and bicycle traffic would exacerbate already constrained conditions. This would be a significant cumulative impact, the same as would result from the proposed project.

To address this issue, the applicant’s traffic analyst recommends the following, as part of project improvements (not yet shown on project plans):

- Maintain the existing configuration of Paradise Drive between the two access points, and widen the road to include four-foot shoulders with 60-foot tapers at the driveway on the south end (access to Lots 18 through 21) and the proposed Forest Glen Court intersection at the north end.

- Install Class III bike route signs, Countywide Bicycle Route Guide Signs, and appropriate warning and advisory signs along the project frontage.

- Pavement improvements and/or road re-stripping as part of the project should include consideration of the needs of bicyclists and shoulders and/or turnouts should be provided where opportunities exist.

The above recommendations address improvements only along the project site frontage (west side of Paradise Drive), which would provide a paved shoulder and refuge area for southbound pedestrians and bicyclists, but would leave conditions as they are today (little to no refuge) for northbound pedestrians and bicyclists through this section.

The proposed Swahn residential project, located on Bluff Point, across Paradise Drive from the 2008 Easton Point Residential Project, proposes some improvements along its Paradise Drive frontage. One proposed improvement is to widen Paradise Drive along the Swahn property’s roadway frontage to the north of the proposed entry gate for the purposes of bicycle and pedestrian safety. An existing shoulder within the Paradise Drive right-of-way would be widened to provide five feet of width from

32  Focused Traffic Study for the Martha Company Project, op. cit.

33  Initial Study Swahn Design Review and Second Unit Permit, Marin County Planning Division, January 2010.
the roadway fog line\textsuperscript{34} to the edge of payment for a distance of approximately 750 feet along the frontage of the Swahn property.

**Mitigation Measure 6.1-6** Implement the following mitigation measures to reduce impacts on bicyclists on Paradise Drive

**Mitigation Measure 6.1-6(a)** The Alternative 2 project sponsor shall improve the property’s Paradise Drive frontage beginning at least 60 feet south of the proposed driveway serving Lots 18 to 21 and extending at least 60 feet north of the proposed Forest Glen Court intersection. Selectively widen the shoulder pavement along the project frontage of Paradise Drive within the public right-of-way.

**Mitigation Measure 6.1-6(b)** Provide Class III bike route signs, Countywide Bicycle Route Guide Signs, and appropriate warning and advisory signs along the project frontage.

**Mitigation Measure 6.1-6(c)** Provide Class III bike route signs, Countywide Bicycle Route Guide Signs, and appropriate warning and advisory signs for northbound traffic, along the opposite side of Paradise Drive (east side of the project frontage of Paradise Drive). To improve conditions for northbound traffic, wherever possible, selectively widen the shoulder pavement along the east side of the project frontage of Paradise Drive within the public right-of-way. Improvements should be coordinated with the Swahn property’s proposed improvements.

**Significance After Mitigation** Implementation of Mitigation Measure 6.1-6 would reduce Alternative 2’s contribution to cumulative impacts to bicyclists to a less-than-significant level, because the provision of additional shoulder width would provide an area for southbound bicyclists refuge outside the motor vehicle travel way for the southbound segment of Paradise Drive along the project site’s Paradise Drive frontage. Selective paved widening on the east side of the project frontage of Paradise Drive would improve conditions for northbound bicyclists. This mitigation would allow southbound motorists to safely pass bicyclists on this segment of Paradise Drive, thus enhancing motor vehicle circulation as well. Although shoulders of varying widths would remain along the east side of the project frontage of Paradise Drive, as well as on other segments of Paradise Drive, the mitigation would result in a net improvement to bicycle and motor vehicle circulation along the project site’s frontage.

**Impact 6.1-7 Alternative 2 Impacts on Pedestrian Circulation**

Alternative 2’s implementation would not result in disruptions to existing pedestrian facilities, or interfere with planned pedestrian facilities, the same as for the proposed project. To a slightly lesser degree than with the proposed project, Alternative 2 residents would be expected to add slightly to the number of pedestrians using Paradise Drive and Hill Haven neighborhood streets. Alternative 2 could improve existing circulation conditions in the Lyford’s Cove/Old Tiburon and Hill Haven neighborhoods. This would be the same as with the proposed project. However, the Alternative 2 site plan does not include any pedestrian improvements (sidewalks or footpaths) within the proposed development areas. Therefore, the only means of public access through the proposed development area would be within a proposed public access easement along the project’s 20-foot wide roadways that would connect the adjacent neighborhoods to Old St. Hilary’s Open Space Preserve. Limiting

\textsuperscript{34} The fog line is the white line painted on the right side of the road. It is used as a tool for drivers to keep on the road during times of poor visibility.
public pedestrian access to the proposed 20-foot wide roadways would be a significant impact on pedestrian safety.

*Alternative 2* proposes three public hiking trails. The first two trails (one starting at the Ridge Road entrance to the project site and then generally paralleling the water tank access road and the second from the end of Spanish Trail Road across the project site to Paradise Drive) are proposed to be completed prior to the issuance of the first certificate of occupancy for any residence within the project site. The third trail would be constructed after removal of the construction access road.

The portion of Paradise Drive fronting the *Alternative 2* project site is a roadway considered unsafe for pedestrian use. *Alternative 2* would add additional pedestrian and vehicular traffic to the unsafe existing roadway condition. While not significant alone, this additional increment of motor vehicle and pedestrian traffic would exacerbate already constrained conditions. This would be a significant cumulative impact.

Additionally, *Alternative 2* would not provide any pedestrian accommodation (no sidewalks or pathways outside the travel lane) on the proposed roads. This would be a significant impact (the same as for the proposed project).

**Mitigation Measure 6.1-7(a)** The following measure would be required to reduce pedestrian circulation impacts.

Make the following off-site roadway improvements, consistent with MCC Section 24.04.510:

- Improve the Forest Glen Court / Paradise Drive intersection per Mitigation Measure 6.1-3 to provide the maximum amount of widening and paved refuge area for pedestrians.
- Design the Lots 18 to 21 driveway / Paradise Drive intersection to provide the maximum amount of widening and paved refuge area for pedestrians.
- Provide paved shoulder widening along both sides of Paradise Drive along the project frontage of Paradise Drive within the public right of way, consistent with the *Paradise Drive Visioning Plan*. Improvements shall be as described in Mitigation Measure 6.1-6(a) (b) and (c). These intersections and widened shoulders would provide additional refuge areas for pedestrians consistent with the safety improvements described in County of Marin and Town of Tiburon planning documents for Paradise Drive.

**Mitigation Measure 6.1-7(b)**

The applicant shall implement project proposed measures along Hill Haven neighborhood streets to improve safety. These include:

- Post signs prohibiting parking along both sides of Diviso Street and along other residential streets narrower than 20 feet wide.
- Provide stop or yield sign control for the side streets intersecting Ridge Road.
- Prohibit placement of dumpsters along Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets if the dumpster would intrude into the travelway. This would effectively prohibit the placement of dumpsters on streets narrower than 28 feet wide.
Although these measures would not address pedestrian safety for all segments of the Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets, conditions in these neighborhoods would be improved. Implementation of Mitigation Measure 6.1-7 would address many sections of the narrow, winding roadways that would be used by project site traffic, and would be considered to reduce project impacts to a less-than-significant level; implementation of these measures would improve existing pedestrian safety by maximizing the width of the travel way on Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets.

Significance After Mitigation  Implementation of Mitigation Measure 6.1-7(a) and (b), together with Mitigation Measures 6.1-3 and 6.1-6, would reduce the Alternative’s impact to pedestrians to a less-than-significant level.

Impact 6.1-8  Alternative 2 Impacts Related to Vehicular Site Access

Access to the residential development under Alternative 2 would be provided at five locations. Two locations would be extensions of existing roads in the Town of Tiburon, and three locations would intersect Paradise Drive in Marin County. The Marin County Code specifically addresses “new driveway transitions” and both the Marin County Code and Tiburon General Plan specifically address intersections with Paradise Drive. Impacts related to site access would be less-than-significant, the same as for the proposed project.

Mitigation Measure 6.1-8  No mitigation would be required.

Impact 6.1-9  Alternative 2 Impacts Related to Project Site Emergency Access

Alternative 2 would create demand for emergency services and require provision of adequate internal circulation for vehicles, pedestrians, emergency vehicles and fire trucks. In the following three locations turnouts would be needed to meet TFPD standards;

- Lot 6 to 8 driveway, in the vicinity of the boundary between Lots 6 and 7.
- Ridge Road north of Lot 9.
- Lots 26 to 28 driveway, on Lot 26.

Additionally, the construction access road, proposed to be removed after construction, would not meet TFPD standards (due to the 25 percent grade) for emergency vehicle access.

For the reasons stated above (needed turnouts, excessive road grade for the construction access road), Alternative 2 would result in a significant impact to emergency access.

Mitigation Measure 6.1-9  Revise the PDP to provide adequate turnouts per TFPD requirements. Post all turnouts with “no parking” signs.

Significance After Mitigation  Implementation of Mitigation Measure 6.1-9 would reduce the project’s impact to emergency access to a less-than-significant level.
Impact 6.1-10  Alternative 2 Traffic Added to Lyford’s Cove / Old Tiburon and Hill Haven
Neighborhood Streets – Accident Records, Emergency Access and Traffic Flow

Long-term Alternative 2 project traffic (all post-construction traffic) added to Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets would not result in significant impacts to existing or future road capacity. However, emergency access vehicles and residents of these existing neighborhoods would be exposed to more frequent unpredictable traffic flow and intermittent safety hazards when traveling on the narrow, winding residential streets. This would be a significant impact.

Compared to the proposed project where a total of 30 homes would have access through the Lyford’s Cove/Old Tiburon and Hill Neighborhood, the number would be reduced to 17 in Alternative 2. Thus this impact would be less than for the proposed project.

Mitigation Measure 6.1-10  In addition to the measures proposed by the applicant, the following additional measure would be required:

- Prohibit placement of dumpsters along Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets if the dumpster would intrude into the travel way. This would effectively prohibit the placement of dumpsters along streets narrower than 28 feet wide.

There are no other clear solutions to the existing narrow, winding streets in the Lyford’s Cove/Old Tiburon or Hill Haven neighborhoods. Road widening would require residents to dedicate lot frontages (lawns and landscaped areas) to the public road right-of-way. It is anticipated that most, if not all, residents would object to such a project.

Significance After Mitigation  Implementation of Mitigation Measure 6.1-10 would address many sections of the narrow, winding roadways that would be used by project traffic, and would be considered to reduce project impacts to a less-than-significant level; implementation of these measures would improve existing roadway safety by maximizing the width of the travel way on Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets.

Impact 6.1-11  Provision of Safe On-Site Roads

The proposed design of on-site roads under Alternative 2 would not meet Marin County standards. The proposed design of on-site roads raises safety concerns related to road widths and shoulder space. This would be a significant impact.

This impact would be the same as for the proposed project.

Mitigation Measure 6.1-11

In order to reduce these significant road design impacts, the Alternative 2 PDP shall be revised to incorporate the following measures:

- Design the two on-site roads (Ridge Road and Forest Glen Court) in compliance with county standards. The Marin County standard for minor residential roads is a minimum 28 foot paved width.

- Provide pedestrian sidewalks or all-weather pathways on one side of all roads.
• In order to create and maintain safe access intersections along Forest Glen Court, combine or redesign access drives to Lots 27 and 28 and Lots 32 and 33 to avoid driveways located along unsafe “blind” curves, per MCC Sections 24.04.060 (b), and (c). Caltrans stopping sight distance safety criteria shall be followed to determine minimum allowable sight distances.

The secondary impacts of constructing the two on-site roads (Ridge Road and Forest Glen Court) in compliance with County standards would be the same as discussed for Mitigation Measure 5.1-11. As discussed for Mitigation Measure 5.1-11 construction of the on-site roads with a minimum 28 foot paved width versus the proposed 20-foot paved width could result in secondary impacts related primarily to geology and soils, hydrology and water quality, and biological resources. See Impact 5.1-11 Provision of Safe On-Site Roads for further discussion of these impacts.

**Significance After Mitigation**  Implementation of Mitigation Measure 6.1-11 would reduce the severity of the project's on-site roadway safety impacts to a less-than-significant level.

**Impact 6.1-12 Provision of On-Site Parking Space**

*Alternative 2* would create a demand for parking spaces, the same as described for the proposed project. This would be a less-than-significant impact per Marin County Code requirements, but would raise concerns for roadway safety due to the narrowness and steepness of on-site roads and the tendency of residents and visitors to park near their destination while ignoring on-street parking prohibitions. This would be a significant impact.

This impact would be the same as for the proposed project.

**Exhibit 6.0-32** provides a list of parking spaces committed to per lot, along with notes on the number of parking bay spaces provided along the access road or driveway within 850 feet (a three-minute uphill walking distance) of the driveway entrance to each lot.

As shown in **Exhibit 6.0-32**, by applying a standard of eight parking spaces per lot, with four spaces on the lot, and the other four spaces either on the lot, or within a three-minute walking distance of the lot, lots 9 through 17 would meet the standard. All other lots would have deficient parking by two to four spaces.

**Mitigation Measure 6.1-12** The proposed project shall provide additional on-site parking to accommodate anticipated parking demands. Each residential site shall provide four on-site parking spaces as required by County Code, plus four additional spaces through the use of parking areas within the building site and on-lot driveway space. As an alternative, the site plan could be revised to provide on-street parking bays or a combination of parking bays plus on-lot spaces. Developers of individual lots shall show that in addition to the four on-lot spaces required by County Code, each lot has adequate space for four additional on-lot parking spaces or an equivalent number of parking spaces in parking bays within a three-minute walking distance (850 feet) of each residence.

**Significance After Mitigation** Implementation of Mitigation Measure 6.1-12 would reduce parking impacts to a less-than-significant level.
### Exhibit 6.0-32
Alternative 2 Proposed Parking

<table>
<thead>
<tr>
<th>Lot Number</th>
<th>Number of parking spaces provided on the Lot per Application Sheet C-11</th>
<th>Number of on-site parking bay spaces within 850 feet (approx 3-minute walking distance) of the Lot driveway</th>
<th>Are eight (8) or more on-site parking spaces available to this Lot (within 850 feet of the Lot driveway)?</th>
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<td>No – deficient by 4 parking spaces</td>
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</table>
6.0 Alternatives to the Proposed Project

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<table>
<thead>
<tr>
<th>Lot Number</th>
<th>Number of parking spaces provided on the Lot per Application Sheet C-11</th>
<th>Number of on-site parking bay spaces within 850 feet (approx 3-minute walking distance) of the Lot driveway</th>
<th>Are eight (8) or more on-site parking spaces available to this Lot (within 850 feet of the Lot driveway)?</th>
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<td>No – deficient by 4 parking spaces</td>
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</table>

Source: Easton Point Master Plan / Precise Development Plan / Tentative Map, CSW / Stuber-Stroeh, December 2009, Sheet C-11

Impact 6.1-13 Construction Traffic Impacts

Buildout of Alternative 2 could add significant amounts of construction traffic to Paradise Drive, adding to the existing sight distance safety concerns at the Paradise Drive / Forest Glen Court intersection, and raising safety concerns about construction truck use of Paradise Drive (related to tight curves and narrow segments of the roadway where large trucks would wander into the opposite direction travel lane). Construction trips also would damage pavement on affected roads and have the potential to disrupt the residential environment. This would be a significant impact.

This impact would be the same as for the proposed project.

The Alternative 2 draft Development Agreement stipulates that if Lots 1 through 8 or Lots 9 through 17 are dedicated to non-residential uses, then the construction access road need not be built. In this case, construction access to Lots 1 through 8 or 9 through 17 would be through the Hill Haven neighborhood. The ten lots with access via Forest Glen Drive plus the Remainder Lot would still have access via Paradise Drive. Construction trucks and other construction traffic through the Hill Haven neighborhood streets would be very noticeable to residents at home during construction hours and would result in a significant intrusion in this neighborhood. Uphill and downhill movement of construction trucks currently is noticed by residents (noise, obstruction of sight distance for cars following behind large trucks, temporary obstruction of progress through intersections too constrained to accommodate large truck turning movements, etc.), and any increase in truck activity would be considered a serious traffic hazard (as is the case today). This would be a significant temporary impact to traffic flow and roadway safety in the Hill Haven neighborhood, especially through the narrowest and steepest roadways, Diviso Street (as narrow as 16.5 feet wide) and Centro West and Centro East streets (as narrow as 17 feet wide). These roadway widths are not sufficient to allow two trucks or a truck and a car traveling in opposite directions to pass one another safely. These would be significant impacts.
Mitigation Measure 6.1-13 The following measures shall be implemented to mitigate construction traffic impacts:

Mitigation Measure 6.1-13(a) The applicant shall implement all measures regarding the construction access road as proposed by Ghilotti Construction Company and Red Horse Constructors, Incorporated.

Mitigation Measure 6.1-13(b) Implement the Construction Management Plan as set forth in the Precise Development Plan and as modified as follows

- Prohibit construction worker, construction vehicle and all other construction activity through existing residential neighborhoods, with the exception of access to Lot 1 which would require use of the upper elevations of Ridge Road and Mountain View Drive.

- Control all uses of the proposed (gated) construction access roadway as a constant safety precaution.

- Implement all project traffic control elements including consolidating delivery of construction materials using routes approved by Marin County and Town of Tiburon, informing Town of Tiburon residents of construction activities and duration, and providing a comprehensive network of flag persons along construction routes. Specifically, care shall be taken to insure safe passage of trucks along designated routes (such as Paradise Drive) by use of flag trucks traveling in front of and behind wide trucks (trucks which may intrude into the opposite direction travel lane). Flag persons shall be stationed along all roadway segments which may require stopping through traffic for safe truck passage or guiding trucks through existing streets.

- During the project’s initial construction phase, construct a Paradise Drive northbound left-turn lane, widen the Forest Glen Court eastbound intersection approach, and grade back the hillside to provide adequate sight distances (minimum 158 feet in each direction). Throughout this phase, flag persons shall be used to insure safety and optimize the flow of through traffic along Paradise Drive.

- Include provisions in contractors’ construction contracts to prohibit parking of construction vehicles anywhere other than on-site.

- In the unlikely event that construction vehicles arrive at the proposed Forest Glen Court site access in sufficient numbers to result in trucks queuing (stacking) in the Paradise Drive through traffic lane, post flagmen on both sides of the queue to coordinate the safe flow of through traffic past the Forest Glen Court site entrance.

- Repair any deteriorated payment along Tiburon Boulevard - Paradise Drive identified in cooperation with the Town of Tiburon and Marin County by a before and after pavement evaluation program which shall determine if project-generated truck traffic caused any additional pavement deterioration.

- Obtain County and Town approval for construction truck haul routes and establish haul truck hours for project construction traffic.

Mitigation Measure 6.1-13(c) Applicable to Alternative 2 if the construction access road is not constructed and access to Lots 1 through 8 or Lots 9 through 17 would be provided through the Hill Haven neighborhood:
In addition to all applicable Mitigation Measures contained in 6.1-13 (a) and (b), implement the following:

- Accelerate as much as possible the grading and site preparation phase(s) for those portions of the site where construction traffic would take access through the Hill Haven neighborhood. If possible, condense grading and hauling within a three-week period (that is with minimum 12-hour weekday and weekend work days) to conclude as rapidly as possible. The Town of Tiburon would need to approve the posting of signs on access routes through the Hill Haven neighborhood to prohibit on-street parking during construction hours.

- Implement all project traffic control elements including consolidating delivery of construction materials to the maximum extent possible, using routes approved by the Town of Tiburon, informing residents of construction activities and duration, and providing a comprehensive network of flag persons along construction routes. Specifically, care shall be taken to insure safe passage of trucks along designated routes (such as specific Hill Haven streets) by use of flag trucks traveling in front of and behind wide trucks (trucks which may intrude into the opposite direction travel lane). Flag persons shall be stationed at all Hill Haven intersections and along all roadway segments which may require stopping through traffic for safe truck passage or guiding trucks through the narrow Hill Haven neighborhood streets.

- Repair any deteriorated pavement along Hill Haven streets identified in cooperation with the Town of Tiburon and Marin County by a before and after pavement evaluation program which shall determine if project-generated truck traffic caused any additional pavement deterioration.

**Significance After Mitigation**  Implementation of Mitigation Measure 6.1-13 would reduce the construction traffic impacts to a less-than-significant level.

**AIR QUALITY**

**Impact 6.2-1  Construction-Period Air Pollutant Emissions**

With Alternative 2, air pollutants emitted during construction could expose nearby neighbors to unhealthy levels of particulate matter and possible Toxic Air Contaminants (TACs). Alternative 2 includes a reduction in grading activities when compared with the proposed project. However potential emission of particulate matter (PM$_{10}$) and Diesel Particulate Matter (DPM) during construction activities would be a significant impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.2-1** - Construction air quality impacts shall be mitigated by implementing the Construction Management Plan as set forth in the Precise Development Plan and as modified as follows:

- The Construction Management Plan shall be modified to require use of off-road construction equipment that was manufactured during or after 1996 meeting the California Tier I emissions standard or is equipped with diesel particulate filters or uses alternative fuels (e.g., biodiesel) that result in lower particulate matter emissions that are at least 20 percent lower than the statewide fleet average reported by the California Air Resources Board.
6.0 Alternatives to the Proposed Project

The Construction Management Plan shall be modified to prohibit the use of “dirty” equipment. Opacity is an indicator of exhaust particulate emissions from off-road diesel-powered equipment. The project shall ensure that emissions from all construction diesel-powered equipment used on the project site do not exceed 40-percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40-percent opacity (or Ringelmann 2.0) shall be repaired immediately. In essence, any piece of equipment that emits dark smoke for more than three minutes would be in violation of this mitigation measure.

The Construction Management Plan shall be modified to ensure that diesel equipment standing idle for more than five minutes shall be turned off. This would include trucks waiting to deliver or receive soil, aggregate, or other bulk materials. Rotating drum concrete trucks could keep their engines running continuously as long as they were on-site.

The Construction Management Plan shall be revised to include the following PM$_{10}$ control measures:

- Prevent visible tracking of mud or dirt on to public roadways or immediately sweep dirt or mud tracked on to roadways.
- Sweep public streets daily (with water sweepers) if visible soil material is carried onto public streets.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

**Significance after Mitigation** - Implementation of Mitigation Measure 6.2-1 would reduce construction-period air pollutant emissions to a less-than-significant level, since the project would implement all BAAQMD recommended PM$_{10}$ control measures for construction activities. In addition, the control measures would reduce construction-period diesel exhaust emissions so that nearby residences would not be subject to nuisance or unhealthy levels of air pollution caused by the project.

**Impact 6.2-2 Generation of Airborne Asbestos**

Similar to the proposed project, implementation of Alternative 2 would include grading that may disturb soils containing serpentine, possibly releasing asbestos fibers into the air. With conformance to BAAQMD regulations this would be a less-than-significant impact.

**Mitigation Measure 6.2-2** No mitigation would be required.

**Impact 6.2-3 Greenhouse Gas Emissions**

Similar to the proposed project, new large residences would be an additional source of GHG emissions, primarily through consumption of energy for transportation and energy usage. Implementation of Alternative 2 would have greenhouse gas emissions less than that of the proposed project. This would be a less-than-significant impact.

**Mitigation Measure 6.2-3** No mitigation would be required.
6.0 Alternatives to the Proposed Project

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NOISE

Impact 6.3-1  Construction Noise

Noise impacts resulting from construction activities would depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Implementation and phasing would be similar to the proposed project. The project applicant would construct road extensions and install infrastructure. Applicant implemented construction would occur in two phases:

- Phase One would include construction of Forest Glen Court and the realigned water line. The construction access road, retaining walls, and paving would occur in this phase. The new MMWD water tank would also be constructed.

- Phase Two would include the clearing, grubbing, grading, landslide repair, subdivision road extensions, utility placement (including installation of pipelines, drop inlets, fire hydrants, electric and cable utility infrastructure) for lots adjacent to the Hill Haven neighborhood. Drainage and utility extensions would also be constructed in this phase.

The construction access road would be the primary access to the site for construction vehicles, including earthmoving, construction materials, and work crews of all construction activities on the project site, including residential home construction. For the majority of homes that would have access from the Hill Haven neighborhood, individual lot owners, when contracting for construction of a specific lot, would be required to include in the construction contract a requirement that all construction access be from the construction access road. Alternative 2 provides for the future removal of the construction access road. The construction access road would be located more than 1,000 feet from existing residents. Noise levels generated during the demolition of the construction access road would be less than 60 dBA Leq.

Construction truck traffic would access the project site via Paradise Drive. Lots 18 through 21 would be accessed directly from Paradise Drive, the rest of the project site would be accessed via Forest Glen Court and the construction access road. Lot 1 would be accessed via the construction access road and then via Ridge Road and Mountain View Drive.

The highest construction noise levels that would occur in the residential areas adjacent to the clustered construction areas would be similar to the proposed project. The primary difference is that fewer houses would be built so the elevated construction noise levels would occur for a shorter period of time than under the proposed project. For example, for the residents on Mountain View Drive and Ridge Road in the Hill Haven neighborhood, four residential lots would adjoin them as opposed to five under the proposed project and eight lots total would be developed in the northwest corner of the project site as compared to 20 under the proposed project. The reduction in the density and the associated reduction in the construction duration in the northwest quadrant is the primary difference between the noise impacts associated with the proposed project as compared to Alternative 2.

35 Draft Declaration of Conditions, Covenants and Restrictions for Easton Point, April 2009, Article V, Subsection G.
As a part of the Precise Development Plan a Construction Management Plan 36 has been prepared. Noise control measures included in the Construction Management Plan include the following:

- Muffle and maintain all equipment used on site. All internal combustion engine-driven equipment shall be fitted with mufflers which are in good condition. Good mufflers shall result in non-impact tools generating a maximum noise level of 80 dBA when measured at a distance of 50 feet.

- Schedule construction activities to have the least impact on noise-sensitive receptors (existing residents) in the area. This shall be accomplished by limiting construction activities, including grading, excavating, and paving, to weekdays between 7:30 AM and 5:30 PM. Allowable construction hours shall be posted clearly on a sign at each construction site.

- Designate a Disturbance Coordinator for the duration of applicant-implemented construction, and also incorporate in the Covenants Conditions and Restrictions document (CC&R’s) the responsibility of the POA to designate a Disturbance Coordinator for the duration of lot-owner construction until full buildout. The Disturbance Coordinator shall:
  - Receive and act on complaints about construction disturbances during infrastructure installation, landslide repair, road building, residential construction, and other construction activities.
  - Determine the cause(s) and implement remedial measures as necessary to alleviate significant problems.
  - Clearly post his / her name and phone number(s) on a sign at each construction site.

As noted above, construction truck traffic would access the project site via Paradise Drive. The construction truck traffic would utilize the construction access road throughout all phases of infrastructure construction and the buildout of residential lots. Lot 1 would be accessed via the construction access road and then via Ridge Road and Mountain View Drive. The construction access road would, therefore, handle most of the construction truck traffic and, thereby, minimize construction truck traffic through existing residential neighborhoods. If Lots 1 through 8 or Lots 9 through 17 were dedicated to non-residential uses, then the construction access road need not be built. In this condition, construction access to the remaining lots to be constructed would be through the Hill Haven neighborhood. Construction truck traffic on the neighborhood streets would be noticeable because heavy trucks rarely utilize the roads, and each individual truck would be noisier than most vehicles currently on the streets. During the phase of construction with the most truck trips it is estimated that up to eight or ten one-way truck passbys per day would access the eight lots. The hourly average noise level along the Hill Haven neighborhood streets would remain below 60 dBA Leq. Given this volume of truck traffic, on a daily average basis, noise levels are calculated to increase about three dBA Ldn along Hill Haven neighborhood streets. The construction truck traffic on local streets, by itself, would cause a less-than-significant impact, but would contribute to overall construction noise levels in the area.

With Alternative 2, similar to the proposed project, construction noise levels would be substantially above the existing measured ambient noise level at existing houses in the vicinity of the project site. Noise-sensitive receptors located within approximately 1,300 feet of busy construction activity could

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potentially experience noise levels of about 60 dBA at times. The increase would be less where terrain shielding occurs. Existing homes located west and northwest of the project site would experience hourly average noise levels of less than 60 dBA $L_{eq}$ during busy construction activities at any of the 32 proposed houses. Levels of 60 dBA would be about ten dBA above the existing levels at some locations that were measured at or near the project site. Noise levels exceeding 60 dBA $L_{eq}$ could be received at nearby homes during earthmoving operations, the construction of foundations, building framing, and finishing.

Project development would expose existing residents, primarily those near the ridgeline, to construction-generated noise. Construction activities to prepare the site and install infrastructure would increase noise levels over a two-year period. Building individual houses would generate noise that would be audible for nearby houses. The duration of building these houses could take several years. Given the potential for substantial increases in noise at adjacent houses as a result of project construction and the likelihood that substantial noise increases would occur for more than one construction season, the construction project would result in a significant noise impact.

**Mitigation Measure 6.3-1** Construction noise impacts shall be mitigated by implementing the Construction Management Plan (including planned mitigation of construction traffic impacts) as set forth in the Precise Development Plan and as modified as follows:

- Modify the construction hours to be consistent with Section 6.70.030(5) of the Marin County Code. Construction hours shall be:
  - Monday – Friday: 7:00 AM to 6:00 PM
  - Saturday: 9:00 AM to 5:00 PM
  - Loud noise-generation construction-related equipment (e.g., backhoes, generators, jackhammers) can be maintained, operated, or serviced at a construction site for permits administered by the Community Development Agency from 8:00 AM to 5:00 PM Monday to Friday only.

- Utilize “quiet” models of air compressors and other stationary noise sources where technology exists.

- Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.

- Prohibit unnecessary idling of internal combustion engines.

- Prohibit audible construction workers’ radios on adjoining properties.
• Notify neighbors of the construction schedule prior to the beginning of each phase that would generate substantial noise (i.e., five dBA or more above ambient levels and exceeding 60 dBA $L_{eq}$).

**Significance after Mitigation**  Implementation of the above mitigation measure would reduce the effects of construction noise upon existing homes in the area. Even after implementing these measures, however, noise levels at adjacent homes would continue to substantially exceed existing ambient noise levels. Because construction is expected to last more than one year, and even after implementing these measures noise levels would substantially exceed ambient levels, this would be a significant unavoidable impact.

**GEOLOGY AND SOILS**

**LANDSLIDE REPAIR**

As discussed in Section 5.4 Geology and Soils the project site is mapped as being underlain by 28 landslides (Landslides 1 through 23, 26, 27, 38 through 40). The locations of the on-site landslides and the approximate distribution of other geologic units are shown on Exhibit 5.4-1.

Marin County’s landslide mitigation policy plus the landslide mitigation policy prepared by Miller Pacific Engineering Group for the project site would apply equally to Alternative 2 as to the proposed project.

Exhibit 6.0-33 describes the proposed landslide stabilization for the on-site landslides for Alternative 2. Exhibit 6.0-34 illustrates the proposed landslide stabilization program for Alternative 2. The same as for the proposed project, for Alternative 2 Miller Pacific proposes stabilization, improvement, or avoidance for the site landslides through the use of subdrains, buried pier and grade beam walls, and debris fences. Exhibit 5.4-4 illustrates the type of landslide repairs the applicant’s geologist proposes.
### Exhibit 6.0-33
**Conceptual Landslide Stabilization Plan – Alternative 2**

<table>
<thead>
<tr>
<th>Landslide</th>
<th>Type</th>
<th>Risk Level</th>
<th>Conceptual Stabilization Plan</th>
<th>Excavated material (Cubic Yards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Active</td>
<td>B</td>
<td>Improve redirect surface drainage away from existing scarp, remove debris and stabilize scarp with riprap.</td>
<td>280 Remove &amp; Replace</td>
</tr>
<tr>
<td>2</td>
<td>Active</td>
<td>A</td>
<td>Repair removal of landslide movement and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
<td>6,047 Remove &amp; Replace</td>
</tr>
<tr>
<td>3</td>
<td>Active</td>
<td>A</td>
<td>Repair with retaining structures and compacted fill buttress in upper portion of slide within 100 feet of building envelopes. Improve lower portion with subsurface drainage.</td>
<td>21,370 Remove &amp; Replace Subdrain</td>
</tr>
<tr>
<td>4</td>
<td>Active</td>
<td>B</td>
<td>Improve with subsurface drainage, restrict building envelopes greater than 100 feet from landslide.</td>
<td>62 Subdrain</td>
</tr>
<tr>
<td>5</td>
<td>Dormant</td>
<td>B</td>
<td>Avoid</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Active</td>
<td>A</td>
<td>Repair removal of landslide material and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
<td>4,037 Remove &amp; Replace</td>
</tr>
<tr>
<td>7</td>
<td>Active</td>
<td>A</td>
<td>Repair removal of landslide material and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
<td>4,122 Remove &amp; Replace</td>
</tr>
<tr>
<td>8</td>
<td>Active</td>
<td>A</td>
<td>Repair removal of landslide material and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
<td>3,364 Remove &amp; Replace</td>
</tr>
<tr>
<td>9</td>
<td>Active</td>
<td>A</td>
<td>Improve with subsurface drainage, construct debris catchment structure near Paradise Drive.</td>
<td>266 Subdrain Debris fence piers</td>
</tr>
<tr>
<td>10</td>
<td>Active</td>
<td>B</td>
<td>Avoid</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Active</td>
<td>A</td>
<td>Repair with retaining structures or compacted fill buttress in upper portion of slide within 100 feet of building envelopes. Improve lower portion with subsurface drainage. Debris fence near Paradise Drive.</td>
<td>1,555 Remove &amp; Replace Pier and grade beam</td>
</tr>
<tr>
<td>12</td>
<td>Dormant</td>
<td>B</td>
<td>Avoid</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Active</td>
<td>B</td>
<td>Avoid</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Dormant</td>
<td>B</td>
<td>Avoid</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Dormant</td>
<td>B</td>
<td>Repair with retaining structure and subsurface drainage within 100 feet of building areas.</td>
<td>23 Pier and grade beam Subdrain</td>
</tr>
<tr>
<td>16</td>
<td>Dormant</td>
<td>A</td>
<td>Repair with compacted fill buttress in upper portion of slide within 100 feet of construction access road.</td>
<td>4,886 Remove &amp; Replace Subdrain</td>
</tr>
<tr>
<td>17</td>
<td>Dormant</td>
<td>B</td>
<td>Avoid</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Dormant</td>
<td>A</td>
<td>Improve with subsurface drainage.</td>
<td>41 Subdrain</td>
</tr>
<tr>
<td>19</td>
<td>Dormant</td>
<td>A</td>
<td>Improve with subsurface drainage.</td>
<td>32 Subdrain</td>
</tr>
<tr>
<td>20</td>
<td>Dormant</td>
<td>A</td>
<td>Improve with subsurface drainage and retaining structures.</td>
<td>36 Subdrain Pier and grade beam</td>
</tr>
<tr>
<td>21</td>
<td>Dormant</td>
<td>A</td>
<td>Improve construct debris catchment structure near Paradise Drive.</td>
<td>10 Debris fence piers</td>
</tr>
<tr>
<td>22</td>
<td>Dormant</td>
<td>A</td>
<td>Improve construct debris catchment structure near Paradise Drive.</td>
<td>10 Debris fence piers</td>
</tr>
<tr>
<td>23</td>
<td>Active</td>
<td>A</td>
<td>Improve with subsurface drainage, construct debris catchment structure near Paradise Drive. If remainder lot developed, change to:</td>
<td>39 Subdrain Debris fence piers</td>
</tr>
</tbody>
</table>
6.0 Alternatives to the Proposed Project

2008 Easton Point Residential Development Draft EIR

Landslide Type Risk Conceptual Stabilization Plan Excavated material Level Plan (Cubic Yards)

<table>
<thead>
<tr>
<th>Landslide</th>
<th>Type</th>
<th>Risk</th>
<th>Level</th>
<th>Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>26/27</td>
<td>Active</td>
<td>A</td>
<td>Repair: removal of landslide material and replacement with compacted fill, subdrainage, and slope reconstruction.</td>
<td>43, 27</td>
</tr>
<tr>
<td>38</td>
<td>Active</td>
<td>B</td>
<td>Avoid</td>
<td>64</td>
</tr>
<tr>
<td>39</td>
<td>Active</td>
<td>B</td>
<td>Avoid</td>
<td>46</td>
</tr>
<tr>
<td>40</td>
<td>Active</td>
<td>A</td>
<td>Repair with series of retaining structures and subsurface drainage. Coordinate with lot grading plan.</td>
<td>64</td>
</tr>
</tbody>
</table>


Based on mapping by Miller Pacific the approximate surface areas of the landslides have been included in this section to help illustrate the potential zones of disturbance created by the proposed mitigation measures. Miller Pacific estimates that grading and excavating for landslide stabilization for Alternative 2 would involve about 42,515 cubic yards of material. The following is a brief discussion of each of the 28 previously mapped landslides and the proposed methods of stabilization for Alternative 2.

**Landslide 1**

Landslide 1 is located near the southwest corner of the site, on Lot 7, along the boundary with Old St. Hilary’s Open Space Preserve. This slide straddles the two properties, with the crown of the landslide on the Easton Point project site and the majority of the slide on the adjacent property. The limits of Landslide 1, as shown on Exhibit 5.4-1, have not been mapped in detail offsite but this relatively small landslide appears to have a surface area of approximately 5,000 square feet. The top of the landslide is located about 200 feet away laterally and 40 feet in elevation below the proposed residential building envelope for Lot 7. Miller Pacific recommends improvement of the landslide by installing riprap on the slope above, to increase slope stability and to control surface drainage and subsurface water (see Exhibit 6.0-34). Miller Pacific estimates that improvement of this landslide could involve grading quantities of 280 cubic yards.

**Landslide 2**

Landslide 2 is also located near the southwest corner of the site, on the same slope, just northeast of Landslide 1. This landslide is located entirely on Lot 8. The limits of Landslide 2, as shown on Exhibit 5.4-1, show the surface area of this moderate sized landslide, to be approximately 17,000 square feet. Landslide 2 encompasses much of the proposed residential building envelope for Lot 8. Miller Pacific recommends complete repair of Landslide 2 through removal and recompaction of this debris (see Exhibit 6.0-34). The slope would also be reconstructed and subdrainage would be added. Miller Pacific estimates that repair of this landslide could involve grading quantities of 6,047 cubic yards.

37 Sheet GR1A Landslide Exhibit, Miller Pacific Engineering Group, revised January 29, 2009.

**Landslide 3**

Landslide 3 is a large landslide complex located on a south facing slope, along the south boundary of the site. Much of the slide extends offsite onto the Hill Haven subdivision, in the area between Straits View Drive and Spanish Trail. The areal extent of Landslide 3 crosses into and affects, Lots 13, 14, 15, 16, 17 and Parcel A. The limits of Landslide 3, as shown on Exhibit 5.4-1, have not been mapped off site. This large landslide complex has an approximate on-site surface area of over 200,000 square feet. This landslide encompasses much of the proposed residential building envelopes for Lots 14 through 17. It just encroaches onto the northeast corner of Lot 13. Landslide 3 also covers a large portion of Parcel A. Miller Pacific recommends complete repair of the upper portion of the landslide within 100 feet of the proposed residential building envelope and improving the slope stability in other areas on the project site (see Exhibit 6.0-34). The upper portions of the slide would be repaired through the use of retaining structures with subdrains and/or grading. Grading would involve removal and recompaction of unstable materials to yield an engineered, compacted fill buttress and the addition of subdrains. Miller Pacific estimates that repair and improvement of this landslide could involve grading quantities of about 21,623 cubic yards.

**Landslide 4**

Landslide 4 is a small landslide on the same, south facing slope, just east of Landslide 3. This slide is also located along the southern boundary of the site. Landslide 3 straddles the line, being half in Open Space Area A and half on proposed Lot 13. This landslide has an approximate surface area of 17,000 square feet. Landslide 4 is more than 100 feet below the residential building envelope for Lot 13. Miller Pacific recommends that this landslide be improved through the use of subdrains (see Exhibit 6.0-34). They also recommend that residential building envelopes be limited to over 100 feet away from this feature. Grading would be expected to be limited to the removal and replacement of soils needed to install the proposed “crow’s foot” subdrain system. Miller Pacific estimates that improvement of this landslide would involve grading quantities of about 62 cubic yards.

**Landslide 5**

Landslide 5 is a relatively small landslide located on a south facing slope, along the south boundary of the site. The slide toes out just outside the project site into a ravine within the limits of the Hill Haven subdivision, in the area of Spanish Trail. Landslide 5 straddles the line and lies partially within Parcel A and Lot 19. This landslide has an approximate on-site surface area of 8,500 square feet. Landslide 5 is not near any of the proposed residential building envelopes. The nearest potential building site, on Lot 19, is about 120 feet to the east. Therefore, Miller Pacific recommends avoidance of this landslide by locating any proposed residential building envelopes at least 100 feet away (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 5, grading is not anticipated.

**Landslide 6**

Landslide 6 is located on a southeasterly descending slope above Paradise Drive, just northeast of Landslide 5. This landslide is located entirely on Lot 19. The slide has been mapped as extending down to Paradise Drive. At the toe of the slope, the landslide crosses the area of the proposed driveway to Lots 18 through 21. The driveway is proposed to extend northerly from Paradise Drive that lies below. Based upon the limits of Landslide 6, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 12,000 square feet. At present, this landslide could potentially pose a threat to the driveway, Paradise Drive, and the proposed residential building envelope for Lot 19. This landslide covers about half of the proposed residential building envelope. Miller Pacific recommends complete repair of Landslide 6 through removal and recompaction (see Exhibit 6.0-34). The slope
would also be reconstructed and subdrainage would be added. Miller Pacific estimates that repair of this landslide could involve grading quantities on the order of 4,037 cubic yards.

**Landslide 7**

Landslide 7 is located on a southeast descending slope above Paradise Drive, just north of Landslide 6. The landslide is located on Lots 18 and 20 and has been mapped as extending down to Paradise Drive. At the toe of the slope, the landslide crosses the area of the proposed driveway to Lots 18 through 21. The driveway is proposed to extend northerly from Paradise Drive that lies below. Based upon the limits of Landslide 7, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 13,000 square feet. At present, this landslide could potentially pose a threat to the driveway, Paradise Drive, and the proposed residential building envelopes for Lots 18 and 20. The landslide lies above Paradise Drive, crosses the driveway and the proposed residential building envelopes for Lots 18 and 20. Topographic relief for the landslide is approximately 75 feet, from the toe of the slide to the landslide headscarp. Miller Pacific recommends complete repair of Landslide 7 through removal and recompaction of this landslide (see Exhibit 6.0-34). The slope would also be reconstructed and subdrainage would be added. Miller Pacific estimates that repair of this landslide could involve grading quantities on the order of 4,122 cubic yards.

**Landslide 8**

Landslide 8 is located on an easterly descending slope above Paradise Drive, just north of Landslide 7. Landslide 8 is located entirely on Lot 21 and has been mapped as extending down to Paradise Drive. At the toe of the slope, the landslide crosses the area of the proposed driveway to Lots 18 through 21. The driveway is proposed to extend northerly from Paradise Drive that lies below. Based upon the limits of Landslide 8, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 10,000 square feet. At present, this landslide could potentially pose a threat to the driveway, Paradise Drive, and the proposed residential building envelopes for Lots 18 and 21. The landslide lies above Paradise Drive, crosses the driveway and is less than 100 feet laterally from the proposed residential building envelopes for Lots 18 and 21. Topographic relief for the landslide is approximately 60 feet, from the toe of the slide to the landslide headscarp. Miller Pacific recommends complete repair of Landslide 8 through removal and recompaction of this landslide (see Exhibit 6.0-34). The slope would also be reconstructed and subdrainage would be added. Miller Pacific estimates that repair of this landslide could involve grading quantities on the order of 3,364 cubic yards.

**Landslide 9**

Landslide 9 is a relatively large landslide located in a ravine on an easterly descending slope above Paradise Drive, just north of Landslide 8. Landslide 9 is partially located on Lot 21, but much of it extends onto Parcel A. Based upon the limits of Landslide 9, as shown on Exhibit 5.4-1, this slide has an approximate surface area of potential disturbance of 37,500 square feet. At present, this landslide could potentially pose a threat to Paradise Drive and the proposed residential building envelope for Lot 21. The landslide has been mapped as being immediately above Paradise Drive and is less than 100 feet laterally from the proposed residential building envelope for Lot 21. The slide is also about 100 feet from the adjacent Chapman residence (2641 Paradise Drive). Topographic relief for the landslide is as much as 220 feet, from the toe of the slide to the landslide headscarp. Miller Pacific recommends that Landslide 9 be improved through the use of a “crow’s foot” subdrain and construction of a debris fence on piers with a catchment structure above Paradise Drive (see Exhibit 6.0-34). Miller Pacific recommends improvement, rather than repair, of this landslide. They estimate that grading would only involve quantities on the order of 285 cubic yards.
**Landslide 10**

Landslide 10 has been mapped by Miller Pacific as a small slide that forms a complex with the much larger Landslide 9. This landslide has been mapped on the same east facing slope and along the north boundary of Landslide 9. Landslide 10 is located entirely within Parcel A. This landslide has an approximate surface area of about 3,600 square feet. Landslide 10 is not near any of the proposed residential building envelopes. The nearest potential residential building envelope, on Lot 21 is about 150 feet to the south. Therefore, Miller Pacific recommends avoidance of this landslide by locating any proposed residential building envelopes at least 100 feet away (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 10, grading is not anticipated.

**Landslide 11**

Landslide 11 is a mega-slide complex that covers much of the project site. This landslide complex is located on the east facing slope and extends from the ridge all the way down to Paradise Drive. In areal extent, Landslide 11 crosses into and affects Lots 9 through 13, Parcel A and the Lands of Keil. The limits of Landslide 11 are shown on Exhibit 5.4-1. This large landslide complex has an approximate on-site surface area on the order of 700,000 square feet. Landslide 11 underlies much of the proposed residential building envelopes for Lots 9 through 13. Landslide 11 also underlies a large portion of Parcel A. The top of the landslide is about 100 feet below the proposed water tank road. Landslide 11 has also been mapped by Miller Pacific as covering an area that constitutes about 40 percent of 0.51-acre Lands of Keil parcel. Topographic relief for the landslide is over 400 feet, from the toe of the slide at Paradise Drive to the landslide headscarp. Because this is such a large and varying slide complex, Miller Pacific recommends a combination of mitigation measures to repair or improve portions of the landslide (see Exhibit 6.0-34). They call for repair with retaining structures and/or compacted fill buttresses in the upper portions of the slide within 100 feet of proposed residential building envelopes. For the lower portions of Landslide 11, they recommend improvement by adding a single subdrain and two debris fences near Paradise Drive. Miller Pacific estimates that repair and improvement of this landslide could involve grading quantities of about 2,118 cubic yards.

**Landslide 12**

Landslide 12 is mapped as a long and narrow, run-out slide. The landslide is located on the same east facing slope and just north of Landslide 11. Landslide 12 is located entirely within Parcel A. This landslide has an approximate surface area of about 28,500 square feet. Landslide 12 is not located near any of the proposed residential building envelopes. Miller Pacific recommends avoidance of this landslide by locating any proposed residential building envelopes at least 100 feet away (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 12, grading is not anticipated.

**Landslide 13**

Landslide 13 is located on the same east facing slope as Landslides 11 and 12. This landslide is located directly above Landslide 12 and extends into Parcel A and the Lands of Keil. Based upon the limits of Landslide 13, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 45,000 square feet. Topographic relief for the landslide is approximately 130 feet, from the top of the slide to Landslide 12 below. Because the limits of this landslide are greater than 100 feet from a

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39 Ibid.
proposed residential building envelope or public improvement, Miller Pacific recommends avoidance in lieu of repair for this slide (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 13, grading is not anticipated.

**Landslide 14**

Landslide 14 is mapped by Miller Pacific as a small debris flow slide. The small landslide is located on the same east facing slope as most of the other landslides. Landslide 14 is located entirely within Parcel A. This landslide has an approximate surface area of 6,900 square feet. Landslide 14 is not located near any of the proposed residential building envelopes or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed residential building envelopes at least 100 feet away (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 14, grading is not anticipated.

**Landslide 15**

Landslide 15 has been mapped by Miller Pacific as a small slide. This landslide is located just above Landslide 14. Landslide 15 is located entirely within Parcel A. This landslide has an approximate surface area of about 6,000 square feet. Landslide 15 is not located near any of the proposed residential building envelopes, but it is within 100 feet of the proposed construction access road. To protect the proposed construction access road, Miller Pacific recommends repair of Landslide 15 through the use of a retaining structure with a pier and grade beam foundation and subsurface drainage (see Exhibit 6.0-34). Miller Pacific estimates that repair of this landslide would involve grading quantities of about 39 cubic yards.

**Landslide 16**

Landslide 16 is located at the west boundary of the project site adjacent to Parcel C and the Old St. Hilary’s Open Space Preserve. From the ridgeline, the slide descends to the east and into Parcel A. The landslide crosses the area of the proposed construction access road that would connect the water tank road and Forest Glen Court. Landslide 16, as shown on Exhibit 5.4-1, has an approximate surface area of 40,000 square feet. This landslide could potentially pose a threat to the construction access road and Parcel C (water tank site). Miller Pacific recommends complete repair of Landslide 16 through removal and recompaction (see Exhibit 6.0-34). Using the remove and replace graded buttress proposal would yield grading quantities of 4,886 cubic yards.

**Landslide 17**

Landslide 17 is mapped as a small debris flow slide. The small landslide is located inside the Landslide 11 complex. Landslide 17 is located entirely within Parcel A. This landslide has an approximate surface area of about 6,600 square feet. Landslide 17 is not located near any of the proposed residential building envelopes or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed residential building envelopes at least 100 feet away (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 17, grading is not anticipated.

**Landslide 18**

Landslide 18 is a small landslide is located within a ravine, on the southeasterly facing slope, about 50 feet above Paradise Drive. Landslide 18 is partially located on Lots 23 and 24, but some of it extends below, onto Parcel A. Based upon the limits of Landslide 18, as shown on Exhibit 5.4-1, this slide has an approximate surface area of 9,500 square feet. The landslide is over 100 feet from the proposed construction access road and is not located near any of the proposed residential building envelopes or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed residential building envelopes at least 100 feet away (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 18, grading is not anticipated.
residential building envelopes for Lots 23 and 24. Topographic relief for the landslide is about 30 feet, from the top of the slide to the toe. Miller Pacific recommends that Landslide 18 be improved through the use of subsurface drainage (see Exhibit 6.0-34). Miller Pacific estimates that improvement of this landslide would involve grading quantities on the order of 41 cubic yards.

**Landslide 19**

Landslide 19 is located within a ravine, on the east facing slope, just east of Parcel C. Landslide 19 is entirely located within Parcel A, however it is only 25 feet from the proposed construction access road. Based upon the limits of Landslide 19, as shown on Exhibit 5.4-1, this small slide has an approximate surface area of 6,000 square feet. Topographic relief for the landslide is about 75 feet from the top of the slide to the toe. Miller Pacific recommends that Landslide 19 be improved through the use of subsurface drainage to help protect the proposed construction access road (see Exhibit 6.0-34). They estimate that improvement of this landslide would involve grading quantities on the order of 32 cubic yards.

**Landslide 20**

Landslide 20 is located within a ravine on the same east facing slope as Landslide 19. The landslide lies just north of Parcel C. Landslide 20 is entirely located within Parcel A, however it is only 40 feet from Parcel C. Based upon the limits of Landslide 20, as shown on Exhibit 5.4-1, this small slide has an approximate surface area of 6,500 square feet. Topographic relief for the landslide is about 125 feet, from the top of the slide to the toe. Miller Pacific recommends that Landslide 20 be improved through the use of subsurface drainage to help protect Parcel C (see Exhibit 6.0-34). They estimate that improvement of this landslide would involve grading quantities on the order of 49 cubic yards.

**Landslide 21**

Landslide 21 is a large landslide located within a broad ravine on the northeast facing slope to the east of the western boundary of the project site. Landslide 21 is bisected by the lot line, lying approximately half in Lot 32 (Remainder Lot) and Parcel A. This landslide coalesces with Landslide 22, at their respective toes at just above Paradise Drive. Based upon the previously mapped limits of Landslide 21, this slide has an approximate surface area of over 70,000 square feet. Topographic relief for the landslide is about 300 feet, from the top of the slide to where it joins Landslide 22. Miller Pacific recommends that Landslide 21 be improved through the use of a debris catchment structure with a fence on piers to be located near Paradise Drive (see Exhibit 6.0-34). They estimate that improvement of this landslide would involve grading quantities on the order of ten cubic yards.

**Landslide 22**

Landslide 22 is located north of Landslide 21 and extends from offsite on the Tiburon Uplands Nature Preserve onto the project site and down to the east, to Paradise Drive. Landslide 22 is located entirely within Lot 32 (Remainder Lot) and coalesces with Landslide 21, at their respective toes just above Paradise Drive. Based upon the previously mapped limits of Landslide 22, this slide has an on-site surface area of about 40,000 square feet. On-site topographic relief for the landslide is on the order of about 170 feet, from the top of the slide to where it joins Landslide 22. Miller Pacific recommends that Landslide 22 be improved through the use of a debris catchment structure with a fence on piers to be located near Paradise Drive (see Exhibit 6.0-34). They estimate that improvement of this landslide would involve grading quantities on the order of ten cubic yards.
Landslide 23

Landslide 23 is located on the east facing slope at the extreme north end of the project site. Landslide 23 extends upslope about 100 feet from Paradise Drive. Landslide 23 is located entirely within Lot 32, the Remainder Lot. Based upon the previously mapped limits of Landslide 23, this slide has a surface area of about 14,400 square feet. Miller Pacific recommends that Landslide 23 be improved through the use of a combination of subsurface drains and a debris catchment structure (see Exhibit 6.0-34). The catchment structure is proposed to consist of a debris fence on piers to be located near Paradise Drive. They estimate that improvement of this landslide would involve grading quantities on the order of 53 cubic yards. Miller Pacific provided these improvement recommendations under the assumption that Lot 32 would not be developed. However, if it is planned to develop this lot, then the applicant’s geotechnical consultant calls for changing their recommendations to complete repair of this landslide through removal and replacement. This is because the proposed access driveway and residential building envelope would be threatened if this landslide reactivates. Miller Pacific also offers an option, in that if this lot is to be developed, it would be repaired through removal and recompacktion of the unsuitable earth materials and the addition of subdrainage. Because repair is not currently being proposed, Miller Pacific does not estimate grading quantities for repair of the landslide.

Landslides 26 and 27

Landslides 26 and 27 are connected, forming one small coalescing slide on the north facing slope at the northeast corner of the site. The landslides lie completely within the limits of Lot 28. Landslides 26 and 27 extend upslope about 150 feet from Paradise Drive. The landslides extend into the area of the proposed residential building envelope for Lot 28. Based upon the previously mapped limits of these landslides, they have a combined surface area of about 10,000 square feet. Miller Pacific recommends that Landslides 26 and 27 be repaired through the use of a series of retaining structures and subsurface drainage (see Exhibit 6.0-34). They estimate that repairing of these slides would involve grading quantities on the order of 70 cubic yards.

Landslide 38

Landslide 38 is on the east facing slope, just below the Lands of Keil. Landslide 38 is located entirely within Parcel A. This landslide has an approximate surface area of about 25,000 square feet. Landslide 38 is not located near any of the proposed residential building envelopes or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed residential building envelopes at least 100 feet away (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 38, grading is not anticipated.

Landslide 39

Landslide 39 is a small debris flow landslide in a south facing ravine, southeast of Landslide 16. Landslide 39 is located entirely within Parcel A. This landslide has an approximate surface area of 3,300 square feet. Landslide 39 is not located near any of the proposed residential building envelopes or roads. Miller Pacific recommends avoidance of this landslide by locating any proposed residential building envelopes at least 100 feet away (see Exhibit 6.0-34). Because no repair or improvements are contemplated for Landslide 39, grading is not anticipated.

Landslide 40

Landslide 40 is located on the east facing slope towards the north end of the property. This landslide lies within the limits of the residential building envelopes for proposed Lots 24 and 25. Landslide 40
extends upslope about 75 feet from Paradise Drive. Based upon the previously mapped limit of this landslide, it has an approximate surface area of 20,000 square feet. Miller Pacific recommends that Landslide 40 be repaired through the use of a series of retaining structures and subsurface drainage (see Exhibit 6.0-34). They estimate that repairing of these slides would involve grading quantities on the order of 110 cubic yards.

**PROPOSED LOT GRADING**

Conceptual grading plans have been prepared for each of the 32 lots. The following is a brief discussion of proposed grading for each lot plus parcels A, B, C and the Lands of Keil parcel.

**Exhibit 6.0-8** provides a summary of the lot grading quantities based on the conceptual grading plans for each of the 32 proposed lots.

**Lot 1**

The grading for Lot 1 would involve minor removal and recompaction of the shallow colluvial soils within the proposed residential building envelope and the proposed driveway that would extend up the hill from Mountain View Drive.

**Lot 2**

The grading for Lot 2 would consist of nominal cut/fill grading to enable construction of the proposed residential building envelope and the driveway.

**Lot 3**

The grading for Lot 3 would be limited to the cut/fill grading to remove and recompact any loose colluvial soils and to enable construction of the proposed residential building envelope and driveway.

**Lot 4**

The grading for Lot 4 would be limited to nominal cut/fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed residential building envelope and driveway.

**Lot 5**

The grading for Lot 5 would be limited to nominal cut/fill grading to facilitate construction of the proposed residential building envelope and driveway.

**Lot 6**

The grading for Lot 6 would be limited to nominal cut/fill grading to enable construction of the proposed residential building envelope and driveway.

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40 Lot Specific Conceptual Grading Plans, 43 sheets (G-1A to G-32A), project applicant, December 15, 2009.
Lot 7

The grading for Lot 7 would be limited to primarily fill grading to remove and recompact the existing loose colluvial soils to allow construction of the proposed residential building envelope and driveway.

Lot 8

The earthwork for Lot 8 would involve grading for fill placement and to remove and recompact any landslide deposits or loose colluvial soils and to enable construction of the proposed residential building envelope and driveway. Additionally, Miller Pacific recommends complete repair of Landslide 2, which would involve removal and recompaction of the entire landslide and the addition of subdrains.

Lot 9

The earthwork for Lot 9 would involve grading to remove and recompact the material present to stabilize the top of this lope of Landslide 11 which is present on this lot. Minor cut/fill grading would also be necessary to facilitate construction of the proposed residential building envelope and driveway.

Lot 10

The grading for Lot 10 would involve removal and recompaction of the loose colluvial soils present to enable construction of the proposed residential building envelope and Ridge Road. It is also proposed to excavate to install subsurface drainage and a buried pile wall, to improve Landslide 11, which underlies much of this lot.

Lot 11

The earthwork for Lot 11 would be limited to minor cut/fill grading removing and recompacting the loose colluvial soils to allow construction of the proposed residential building envelope and the roadway along the lot’s southern boundary. It is also proposed to excavate to install subsurface drainage and to add a buried pile wall, to improve Landslide 11, which underlies much of this lot.

Lot 12

The earthwork for Lot 12 would be anticipated to involve minor cut/fill grading of the proposed residential building envelope and adjacent roadway (Ridge Road cul-de-sac). It is also proposed to add a buried retaining wall and also to excavate and install subsurface drainage to improve Landslide 11, which underlies much of this lot.

Lot 13

The grading for Lot 13 would be limited to cut/fill grading to remove and recompact existing loose colluvial soils and landslide materials to enable construction of the proposed residential building envelope and adjacent roadway (Ridge Road cul-de-sac). It is proposed to install subsurface drainage to improve Landslide 11, which underlies this lot. It is also proposed to excavate to install subsurface drainage and a buried pile wall, to improve Landslide 4, which is located below the proposed residential building envelope on this lot.
Lot 14

The earthwork for Lot 14 would be limited to cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed residential building envelope and adjacent roadway (Ridge Road cul-de-sac). It is also proposed to excavate to install subsurface drainage and a buried wall to improve Landslide 3, which underlies much of this lot.

Lot 15

The grading for Lot 15 would consist of cut / fill grading to remove and recompact existing loose landslide materials to stabilize the portion of Landslide 3 that encroaches onto this proposed lot. Minor additional grading will be needed to enable construction of the proposed residential building envelope and adjacent roadway. It is also proposed to excavate to install subsurface drainage to improve Landslide 3, which underlies much of this lot.

Lot 16

The grading for Lot 16 would involve removal and recompaction of earth materials to repair the upper portion of Landslide 3 that underlies most of this lot. Cut / fill grading would also be necessary to enable construction of the proposed residential building envelope and adjacent roadway to the north. It is also proposed to excavate to install subsurface drainage to improve Landslide 3.

Lot 17

The grading for Lot 17 would include removal and recompaction of the existing loose colluvial soils and landslide materials to enable construction of the proposed residential building envelope and adjacent roadway to the north. It is also proposed to excavate to install subsurface drainage to improve Landslide 3, which encroaches onto this lot.

Lot 18

The grading for Lot 18 would include grading to remove and recompact Landslide 7 that occupies much of the lot. The loose colluvial soils must also be removed and recompacted to enable construction of the proposed residential building envelope and adjacent driveway to the north. It is also proposed to add subdrainage to improve Landslide 7.

Lot 19

The earthwork for Lot 19 would include grading to remove and recompact Landslide 6 that occupies much of the lot. The loose colluvial soils must also be removed and recompacted to enable construction of the proposed residential building envelope and adjacent roadway to the south. It is also proposed to excavate and add subdrainage to improve Landslide 6, which encroaches onto this lot.

Lot 20

The grading for Lot 20 would involve removal and recompaction of the portions of Landslide 7 that underlie that proposed lot. Subdrainage would also be added in the buttress keyway. Other minor cut / fill grading would also be needed to enable the construction of the proposed residential building envelope and the adjacent driveway.
Lot 21

It is proposed to remove and recompact the slide material from Landslide 8, which lies entirely within this lot. Subdrainage, associated with the fill buttress, will be added. The grading for Lot 21 would include cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed residential building envelope and access driveway. It is also proposed to improve Landslide 9, much of which also lies within this lot.

Lot 22

The grading for Lot 22 would include cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed residential building envelope and Forest Glen Court.

Lot 23

The grading for Lot 23 would be include cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed residential building envelope and Forest Glen Court. It is also proposed to improve Landslide 18 by installing subsurface drainage.

Lot 24

The grading for Lot 24 would involve the minor cut / fill grading necessary to construct the proposed residential building envelope and the Forest Glen Court roadway to the north.

Lot 25

The grading for Lot 25 would be limited to nominal cut / fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed residential building envelope and Forest Glen Court to the north. It is also planned to stabilize Landslide 40 with buried pier and grade beam walls and subdrains.

Lot 26

The grading for Lot 26 would include cut / fill grading to remove and recompact any existing loose colluvial soils to enable construction of the proposed residential building envelope and driveway to the northeast.

Lot 27

The grading for Lot 27 would include cut / fill grading to remove and recompact any existing loose colluvial soils to enable construction of the proposed residential building envelope and driveway to the west.

Lot 28

The grading for Lot 28 would include cut / fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed residential building envelope and driveway to the west. It is also proposed to repair landslides 26 and 27 through the use of subdrains and buried pier and grade beam walls.
6.0 Alternatives to the Proposed Project

2008 Easton Point Residential Development Draft EIR

Lot 29

The grading for Lot 29 would be limited to nominal cut/fill grading and removal and recompaction of loose colluvial soils, to facilitate construction of the proposed residential building envelope and driveway.

Lot 30

The grading for Lot 30 would be limited to nominal cut/fill grading to facilitate construction of the proposed residential building envelope and driveway.

Lot 31

The grading for Lot 31 would include cut/fill grading to remove and recompact existing loose colluvial soils to enable construction of the proposed residential building envelope and driveway to the southwest.

Remainder Lot

The grading for the Remainder Lot would be limited to nominal cut/fill grading to remove and recompact existing loose colluvial soils to allow construction of the proposed residential building envelope and access driveway from Paradise Drive below. It is also planned to improve Landslide 23 by adding subdrains and a debris fence. However, if this lot is developed, then it is proposed to completely repair Landslide 23 through removal and recompaction of the landslide and colluvial materials.

Parcel A

Minor cut/fill grading in previously mentioned areas of removal and recompaction, where landslides encroach into proposed building and roads, the excavation and installation of subdrains has also been recommended in several places in this open space area.

Parcel B

No grading is proposed within the limits of this parcel.

Parcel C

The earthwork for Parcel C would involve minor cut/fill grading to allow for construction and to establish the desired grade for the proposed water tank site. Minor cut/fill grading would also be necessary to allow construction of the proposed construction access roadway along the site’s western boundary.

Lands of Keil

No grading is proposed within the limits of this parcel.
6.0 Alternatives to the Proposed Project

2008 Easton Point Residential Development Draft EIR

IMPACT ANALYSIS

Impact 6.4-1  Landsliding

As discussed for the proposed project, numerous landslides are present on the project site, some of which are located in or within 100 feet of proposed residential building envelopes and public improvements. Other landslides are located in proposed open space areas and on portions of lots over 100 feet from existing landslides. If the portions of landslides that encroach onto proposed residential building envelopes and proposed public improvements are not adequately mitigated, landslides could reactivate, possibly causing bodily harm and / or property damage. In Alternative 2 landslides that would threaten the proposed development and improvements include landslides 2, 3, 6, 7, 8, 11, 15, 16, 19, 20, 23, 26, 27, and 40. Except for landslide 15, each of these landslides has been designated as Risk Level A by Miller Pacific. Landslide 15 has been designated as Risk Level B (see Exhibit 6.0-33).

Impacts related to landslides on the project site for Alternative 2 would be the same as for the proposed project. For a more detailed discussion regarding the proposed landslide stabilization plan see Impact 5.4-1 Landsliding. As discussed in Impact 5.4-1 repair and improvement methods proposed by Miller Pacific include additional grading, retaining walls (or subsurface pile walls), debris fences, rip-rap, and subdrains. Included within the mitigation measures proposed is the requirement to repair any landslide within 100 feet of a proposed residential building envelope or public improvement. Other landslide areas are to be avoided or improved. The stability of the landslides left in place has not been determined and, therefore, the long-term performance cannot be definitively predicted. Based upon the history and past poor performance of unrepaired landslides on the Tiburon Peninsula, future landsliding, in areas of the project site not destined for complete repair, cannot be ruled out. It is, however, noted that since the site instability is an existing condition, neither the Marin County landslide mitigation policy nor the Miller Pacific policy, developed for this project, would require that landslides outside the proposed development be completely repaired.

Mitigation Measure 6.4-1  The following mitigation measures would be required to mitigate significant impacts related to landsliding:

Prior to the issuance of any grading permit a design level comprehensive geotechnical report shall be prepared and submitted to Marin CDA-Building & Safety Division or Marin County Department of Public Works. The geotechnical report shall include an engineering geologic and geotechnical investigation on a lot-by- lot basis before development of roadways and utilities and within proposed residential building envelopes of each individual lot. The report shall include a comprehensive design-level grading plan including a landslide stabilization program on all lots and a long-term maintenance program for the stabilization program. The repair program shall be implemented by the applicant. Furthermore,

- All landslides shall be eliminated, repaired, improved, or avoided in accordance with Marin County landslide mitigation policy and the landslide criteria and mitigation policy established for this project by Miller Pacific Engineering Group.
- For each landslide present on the project site the limits shall be verified.
- For each landslide repair proposed, the limits should be verified.
Landslide 9 shall be completely repaired in accordance with Miller Pacific’s criteria for landslide repair. Landslide 9 is less than 100 feet from the proposed building site for Lot 23. However, unlike as is specified in the Miller Pacific’s landslide repair plan, this landslide is only scheduled for improvement. Stabilizing this small landslide would eliminate the inconsistencies present in the conceptual repair plan.

The geotechnical report shall include stability calculations for landslides or portions of landslides within 100 feet of the residential building envelopes or public improvements to confirm that proposed repair methods would provide a factor of safety of at least 1.5 for static conditions and greater than 1.0 for pseudo-static (seismic conditions).

For landslides that shall not be repaired or improved it shall be documented that the proposed project will not have an adverse impact on the existing landslide and that the project will either improve or not further exacerbate the landslide.

A long-term maintenance program that provides for periodic inspections and maintenance of the recommended landslide stabilization program during the life of the project shall be included. The maintenance program shall provide for:

- Periodic geologic inspections
- Monitoring of geotechnical and hydrologic mitigation measures to assure effectiveness.
- A schedule for routine cleaning and maintenance of drainage devices.
- Provisions to provide recommendations for additional erosion control or mitigation of any unforeseen hazards which develop in the future.
- Provision for a regular reporting schedule.
- Identification of an entity responsible to implement the maintenance program.

**Significance after Mitigation** Implementing the recommendations of the applicant’s geotechnical consultant and future recommendations of detailed lot-specific investigations would provide landslide repair techniques capable of reducing potential slope instability hazards to residential building envelopes and public improvements to a less-than-significant level.

**Impact 6.4-2 Slope Stability**

With Alternative 2 unrepaired areas of colluvial and landslide deposits could erode or fail locally until they reach equilibrium. This would be a significant impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.4-2** The applicant and individual lot owners and their respective geotechnical consultants shall implement the following measures in order to mitigate the impacts of low shear strength of some fill soil materials and possible erosion of some slopes.

- Evaluate the strength and other soil index properties of the on-site earth units. In areas that require removal and replacement to create an earth filled buttress, within 100 feet of a proposed residential building envelope or public improvement, excavate and replace any loose colluviums
or other earth units encountered with certified, engineered compacted fill soil and add proper subdrainage.

- Design drainage facilities, on cut and fill slopes, to include terrace drains every 30 feet of vertical height on all slopes. The terrace drains shall have a minimum flowline gradient of six percent to make them self-cleaning (a minimal tenet of the Uniform Building Code). They also shall be fitted with downdrains every 150 linear feet of terrace length to allow for quick drainage (also UBC).

**Significance after Mitigation** Implementation of Mitigation Measure 6.4-2 would reduce the potential impact of shallow soil deposits to a less-than-significant level.

**Impact 6.4-3 Seismicity**

Strong seismic shaking is expected to occur on the site some time during the effective “life” of development. This would be a significant impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.4-3** All site development shall comply with all applicable seismic design provisions of the most recent County-adopted Uniform Building Code criteria for structures in Seismic Zone 4.

**Significance after Mitigation** Implementation of Mitigation Measure 6.4-3 would reduce the impact of seismically induced ground shaking to meet building code criteria. The basic requirement is that new structures should withstand ground movement from a minor earthquake without damage; from a moderate earthquake without structural damage; and from a major earthquake without collapse. It is acknowledged that seismic ground shaking impacts cannot be eliminated even with site-specific geotechnical investigations and building requirements. Exposure to seismic hazards is a generally accepted part of living in the San Francisco Bay Area and, therefore, implementation of Mitigation Measure 6.4-3 would reduce seismic ground shaking impacts to a less-than-significant level.

**Impact 6.4-4 Groundwater**

The conceptual landslide stabilization plan for Alternative 2 is intended to increase the stability of existing on-site landslides through proposed measures such as earth fill buttresses, buried pier and grade beam walls, and subdrains. All of these methods of landslide improvement have the potential to convert groundwater to surface water. By intercepting groundwater emanating from the fractured bedrock on the ridges and perched within colluvial or landslide deposits, subsurface water recharge could potentially be significantly reduced.

*Alternative 2* eliminates several lots in the upper portions of the project site that are included in the proposed project. Lots, along Ridgeline C upslope of the Lands of Keil and Keil Spring, in the proposed project that have been eliminated in *Alternative 2* include Lots 24 and 35 through 43. This area is located along the head scarps of Landslides 11 and 13 and it extends up the slope to the proposed water tank road (Mt. Tiburon Court in the proposed project). As shown on the landslide stabilization plan (see Exhibit 6.0-34) in *Alternative 2* portions of Landslides 11 and 13 would not require repair. By eliminating these lots, the reduced repair needed for Landslide 11 and the elimination of the required repair to Landslide 13 *Alternative 2* would reduce the volume of subsurface water that would be intercepted and converted to surface. As a result the subsurface flow and recharge of the groundwater that feeds Keil Spring would be preserved. The impact to Keil Spring, therefore,
would be less-than-significant. In regard to the impact to Keil Spring Alternative 2 would be a substantial improvement over the proposed project.

Other groundwater impacts associated with Alternative 2 are discussed in Impact 6.5-4 Groundwater Recharge and On-Site Hydrology, 6.5-5 Groundwater Recharge and Off-Site Hydrology and 6.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply.

**Mitigation Measure 6.4-4** No mitigation would be required.

**Impact 6.4-5 Artificial Fill Areas**

New construction on existing artificial fill, if present, could settle unevenly and be damaged or could stimulate or accelerate erosion. This would be a significant impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.4-5** In order to mitigate this potential impact, it would be necessary to implement the following measures and to incorporate them in the CC&Rs for implementation by individual lot owners and lot cluster developers in the future:

- Before preparing site-specific designs and receiving building permits, conduct field investigations to determine the presence and limits of such materials in the vicinity of parts of the site proposed for development.

- After receiving grading or site alteration permits from the County, remove and recompact artificial fill located in or adjacent to areas of proposed grading under the observation and testing of a registered geotechnical engineer.

**Significance after Mitigation** This measure would reduce potential impacts to a less-than-significant level.

**Impact 6.4-6 Expansive Soils**

With Alternative 2 development (structures, roads, utilities) located on expansive soils could be damaged by dislocations caused by cyclic shrinking and swelling. This would be a significant impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.4-6** The applicant and individual lot owners and their respective geotechnical consultants would be required to implement the following measures to reduce impacts of the site's expansive soils on development to a less-than-significant level:

- Perform plasticity index or expansion index testing after grading to determine the specific shrink-swell potential for development sites as deemed appropriate by the respective geotechnical engineer(s).

- Identify site-specific mitigation which accounts for conditions present at proposed development sites. Typical measures to treat expansive soils shall include the following (or their equivalent):
- Pre-saturating fill soils and placing wet fill soils (above optimum moisture content) to expand the soil, thereby reducing potential damage to concrete by allowing room for future shrink / swell movement of the soils.

- Placing a non-expansive imported soil in the upper part of residential building envelopes.

- Burying expansive soils deep in fills.

- Treating soil with lime.

- Mixing expansive soils with less expansive soils.

- Designing foundation footing systems to incorporate measured variations of soil swell with effective confinement (dead weight).

- Design residential development on individual lots to account for each site's expansive soils. Measures typically incorporated in building design shall include (or their equivalent):
  - Strengthening foundations (beam).
  - Using suspended wood floors, drilled pier and grade-beam foundations, floating slabs, or pre-stressed (post-tensioned) slabs on-grade.
  - Treating with chemicals.
  - Combining two or more of these techniques.

**Significance after Mitigation** Implementation of Mitigation Measure 6.4-6 would reduce the impacts of expansive soils to a less-than-significant level.

**HYDROLOGY AND WATER QUALITY**

*Alternative 2* contains several revisions to the proposed project that would affect hydrology and water quality issues. These include:

- Reduction in developed residential lots: Thirteen lots slated for development in the proposed project (generally Lots 1, 2, 10, 24, and 35 through 43) have been eliminated in the *Alternative 2* site plan. Eleven of these lots were formerly located along the ridgeline, upslope of the Lands of Keil inholding and Keil Spring. The remaining two lots had occupied small portions of the on-site development within the Railroad Marsh Watershed.

- Addition of one residence on the Remainder Lot and one residence on Lot 19 (proposed project Lot 21): The Remainder Lot development, located on a northeast-trending spur ridge, would include an access drive off Paradise Drive. The new residence on Lot 19 has been added in association with a redrawing of lot boundaries for proposed project Lots 21 through 23, and would utilize the driveway formerly incorporated to serve these lots.

- Reduction of the number of sites and the total surface area affected by the most severe form of landslide stabilization, termed “remove and replace” (i.e. engineered, compacted fill buttress
construction), as well as a reduction in the number of lot-based dewatering systems in proportion to the reduction in developed lots.

- Future removal of the construction access road, extending upslope from the existing MMWD water tank to the ridgeline water tank. The construction access road would be removed within ten years of its construction and would be converted to a hiking trail using more permeable trailbed material.

- Construction and/or upgrading of two hiking trails: The first would extend from Ridge Road, roughly paralleling the ridgeline water tank access road, to the Old St. Hilary’s Open Space Preserve. The second trail would extend from the end of Spanish Trail Road in Watershed E, across the public open space (Parcel A), to Paradise Drive between the Remainder Lot access drive and Lot 31. A third trail would occupy the abandoned roadbed once the construction access road was removed (noted above).

While the development configuration was revised and the density of development decreased for Alternative 2, the locations and numbers of detention facilities for designated stormwater treatment zones remained unchanged. These detention facility locations and outfall alignments are shown in the context of the Alternative 2 site plan in Exhibit 6.0-36. Note that, as for the proposed project, only some of the proposed residential surfaces would drain to these common detention facilities. Stormwater generated over the remainder of the lot’s impervious surfaces would be treated by individual lot detention systems.

**HYDROLOGY AND WATER QUALITY -- IMPACTS AND MITIGATION MEASURES**

**Peak Flow Assessment**

The applicant's civil engineer prepared a revised Drainage Report for Alternative 2 which includes calculations for peak discharge rates generated by the ten-year and 100-year design rainstorms over project site watersheds using the Marin County rainfall-runoff methodology. Clearwater Hydrology (the EIR hydrologist) conducted a peer review of the revised Drainage Report, including the assumptions made for runoff coefficients (“C” value) and selected rainfall intensities. As with the project peer review, the EIR hydrologist disagreed with the assumed “C” value in the revised Drainage Report for the reasons stated previously (see discussion in Section 5.5 Hydrology and Water Quality). The EIR hydrologist’s independent peak flow computations applied a lower runoff coefficient for undeveloped watershed condition (0.4 versus 0.65) and a slightly higher coefficient value for paved roadways (0.95 versus 0.90). The independently derived “C” values were based on those published by the U.S. Geological Survey for use in stormwater drainage design in the San Francisco Bay Region. As with the proposed project Drainage Report, the revised Drainage Report includes calculations for sizing detention facilities with the aim of attenuating post-project increases in peak flow rates to the ten-year level, while also detaining the increase in runoff volume for the 100-

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year design storm. Detention vault outlet controls (e.g. orifices) would be sized during the final design phase to ensure that ten-year existing peak flow rates would be maintained for the ten-year up to the 100-year design storms under the post-project condition in each component watershed.

For the same reasons outlined in Section 5.5 Hydrology and Water Quality, the EIR hydrologist conducted independent detention volume calculations based on a single, consistent methodology. The method used was the Modified Rational Method, as presented in Pond Sizing for Rational Formula Hydrographs.  

Exhibit 6.0-35 documents the detention facility size requirements for Alternative 2 as calculated by the EIR hydrologist. Also presented in the exhibit are the existing condition and post-project 100-year peak flow rates, along with the existing condition ten-year peak flow rate. Further information on the EIR hydrologist's calculation methodology, including delineated watershed areas and spreadsheets used to compute the peak flow rates and detention volumes listed in Exhibit 6.0-35, is included in the Appendix. The EIR hydrologist delineated areas deemed appropriate for completing the detention volume calculations on the AutoCAD file provided by the applicant's civil engineer. When conducting the detention analysis, the EIR hydrologist utilized additional impervious lot areas that the revised Drainage Report stated would drain to a particular detention facility. The detention facility and detention facility outfall locations are shown on Exhibit 6.0-36(a) and 6.0-36(b).

### Exhibit 6.0-35
**Peak Flow Rates and Detention Facility Size for Alternative 2**

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45 The detention facility and detention facility outfall locations are in the same locations as presented in the Drainage Report and on the Grading Plan, Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C-1A and C-1B, Backen Gillam, International Planning Associates, CSW/Stuber-Stroeh, revised January 29, 2009, for the proposed construction access road.
 Detention Facility No. | 10-Year Pre-Project (cfs) | 100-Year Pre-Project (cfs) | 100-Year Post-Project (cfs) | Detention Facility Size (ft³)
--- | --- | --- | --- | ---
6G | 0.07 | 0.10 | 0.44 | 306
6H | 0.09 | 0.14 | 0.40 | 256
15 | 0.06 | 0.10 | 0.41 | 268
16 | 0.05 | 0.07 | 0.48 | 477
17 | 0.14 | 0.23 | 1.03 | 771
18 | 1.55 | 2.41 | 3.55 | 1,589
19 | 0.11 | 0.17 | 0.63 | 453
21 | 0.19 | 0.29 | 1.30 | 1,176
22A | 0.32 | 0.49 | 2.10 | 2044
22B | 0.37 | 0.58 | 1.46 | 991
23A | 0.80 | 1.25 | 1.76 | 760
23B | 0.85 | 1.33 | 2.04 | 874

a No detention is required at the location of Detention Facility number 1. The post-project watershed area is reduced from the pre-project watershed area resulting in lower peak flow rates under the post-project condition.

Source: Clearwater Hydrology 2010

As noted above, the watershed concentration points used for assessment of the proposed project were maintained for the Alternative 2 analysis. Similarly, to ensure peak flow rates would not increase at each outfall, and thus at the culvert crossings below Paradise Drive, the EIR hydrologist calculated pre-project peak flow rates based on the pre-project watershed area for each outfall location. The post-project peak flow rate was then calculated for the entire area contributing to the outfall location. As for the proposed project, each post-project watershed area was larger than the pre-project watershed area due to proposed grading and road construction (except for the watershed area for Detention Facility number 1 see Exhibit 6.0-36(a)). The peak flow rates were assessed in the manner described above to account for modifications to site drainage patterns, and to ensure that the ten-year pre-project discharge to and through the culverts under Paradise Road would remain unchanged for post-project conditions.

The detention facilities proposed as part of the proposed project would be replicated for Alternative 2. An orifice or downsized pipe would direct regulated flow to an open channel, some type of dispersion structure, or into a contiguous, down-gradient segment of the storm drain system. As discussed in the revised Drainage Report, the detention facilities have been proposed to store the additional volume of runoff from the 100-year post-project design storm, and release the pre-project ten-year peak flow during the post-project ten-year to 100-year design storms (i.e. during a post-project 100-year design storm the flow rate from the detention facility would be equivalent to the ten-year pre-project flow rate).

The revised Drainage Report also includes an example calculation for detention facility sizing for the individual houses. As noted for the proposed project, each house would go through a separate design review process at the time the house is developed. Each house would be responsible for the design and construction of the associated detention system, unless it is one of the houses that has been assumed to drain to the road detention system (see revised Drainage Report and the Appendix). Although the revised Drainage Report refers to orifice sizing for the ten-year pre-project release, no
Exhibit 6.0-36 (a)
Detention Facility and Outfall Locations

Legend
- Detention Facility
- Detention Facility Outfall
- Seep
- Spring
- Seasonal Pond
- Roadway Culvert
- Existing Condition Watershed Boundary

#1 - Detention Facility and Outfall Number
2 - Watershed Designation

Source: Clearwater Hydrology 2010. Base Topography provided by applicant. Detention vault locations and discharge points provided by Land Development Solutions, Inc. Seeps, spring and pond mapped by the applicant’s and EIR consultants since 1995.
Exhibit 6.0-36 (b)
Detention Facility and Detention Facility Outfall Locations

Source: Clearwater Hydrology 2010. Base Topography provided by applicant. Detention vault locations and discharge points provided by Land Development Solutions, Inc. Seeps, spring and pond mapped by the applicant’s and EIR consultants since 1995.
Alternatives to the Proposed Project

2008 Easton Point Residential Development Draft EIR

orifice calculations were completed. Exhibit 5.5-4 lists the type of detention facility outfall expected at each outfall location presented in the revised Drainage Report.

Presented in the revised Drainage Report is a sample calculation for the future development of Lot 23, which is a different lot location than was assessed for the proposed project. The EIR hydrologist completed detention facility sizing calculations for Lot 23 using the Modified Rational Method. Assumptions for lot impervious areas are presented in the Appendix. Because all impervious area is presumed to be pervious prior to the development of each lot, and the assumed time of concentration for each lot would be five minutes, the calculated detention facility size presented in the Appendix for Lot 23 would be proportional to all lots at the project site. For example, Lot 23 was determined by the EIR hydrologist to include 5,786 square feet of developed area, requiring 189 cubic feet of detention storage. That means there would be 32.7 cubic feet of detention storage for every 1,000 square feet of impervious area. Thus, a lot with 6,000 square feet of developed area would require 196 cubic feet of detention storage.

Because the EIR hydrologist used a different, more accurate methodology for computing detention volume requirements, those volumes (see Exhibit 6.0-35) are not necessarily comparable to the volume estimates cited in the revised Drainage Report. If the detention volumes calculated by the EIR hydrologist are utilized and outlet controls are appropriately sized to maintain detention facility outflows at the ten-year pre-project level, there should be no impact to the unobstructed conveyance capacity of the culverts below Paradise Road. The potential for project-induced culvert sedimentation and obstruction, which could impair culvert conveyance capacities regardless of the proposed upstream detention facilities, is addressed below in Impact 6.5-3 Site Drainage Patterns - Erosion and Sedimentation and Impact 6.5-7 On-site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection.

Impact 6.5-1 Water Quality

Implementation of Alternative 2, when compared to the proposed project, would decrease the area devoted both to impervious surfaces (roads, driveways and roof tops) and to potentially irrigated landscaping. Watershed buildout under the proposed project, including the construction access road, would slightly increase the urbanization (36 percent to 37.4 percent) in the Keil Cove Watershed, including Watersheds E through G, but would decrease urbanization from 13 percent to ten percent in the watershed tributary to Keil Pond, including Watersheds H through P. Similarly, Alternative 2 development would result in an impervious surface area increase (from 9.3 percent to 10.4 percent) for Watersheds Q through AA (draining north to Central San Francisco Bay) and a slight decrease in impervious area for Watershed C and its off-site component, which drains to Railroad Marsh. These comparative developable area percentages were computed for both the on-site and off-site portions of the watersheds that originate on-site.

Once the construction access road is removed and converted to a hiking trail, it is likely that the impervious surface coverage within the Keil Pond Watershed would be further reduced, albeit slightly. For the North San Francisco Bay Watershed (Watersheds Q through AA), the reduction in impervious coverage afforded by removal of the construction access road would be offset by the expanded

46 Five minutes is accepted as the minimum time of concentration for a small watershed.

47 No orifice sizing calculations were completed in the Drainage Report since the configuration of the detention facilities is unknown until final design.
buildable area associated with the Remainder Lot. Consequently, both the level of automobile traffic and the area converted from native vegetation to managed landscaping would be reduced in the Keil Pond and Railroad Marsh Watersheds, and slightly increased in the Keil Cove and North San Francisco Bay Watersheds. These changes would either reduce or slightly increase the concentrations and quantities of oil and grease, and heavy metals entrained or dissolved in site stormwater runoff compared to the proposed project. The off-site discharge of fertilizers and chemical residues associated with lawn and landscape maintenance would similarly decrease or increase slightly under Alternative 2. While the risks to water quality in Keil Pond, Keil Cove and Central San Francisco Bay would remain a significant impact due to the sensitive habitat of Keil Pond and the listing of Central San Francisco Bay under the Clean Water Act, Section 303(d) list of impaired water bodies (see Impact 5.5-1 Water Quality discussion), the overall impact would be slightly less than for the proposed project.

Mitigation Measure 6.5-1 The applicant shall implement the following mitigation measures in order to reduce the project’s water quality impacts to less-than-significant levels:

Mitigation Measure 6.5-1(a) Implement the construction BMPs shown on the applicant's Stormwater Control Plan (SCP). Specific locations and coverage for BMPs in the SCP pertain to common facilities such as roads and the new water tank area. These BMPs include silt control devices and jute netting installed for protection of disturbed terrain. In addition, the applicant shall prepare a Stormwater Pollution Prevention Plan (SWPPP) to be implemented during construction to ensure adequate measures would be taken to protect water quality. The SWPPP shall pay particular attention to the following:

- The construction access road and associated vehicular pollutants.
- Vehicle wash areas to ensure that sediment is not tracked onto Paradise Drive.
- Fuel and other toxic compound storage.
- BMPs (best management practices) to control sediment and erosion.
- Revegetation.
- Trash control.

Marin County Code Section 24.04.627, provides additional information on SWPPP requirements. Preparation and implementation of a SWPPP is required for approval of coverage under the Construction Activities Stormwater General Permit issued by the San Francisco Bay Regional Water Quality Control Board. A NPDES Construction Activity General Permit would be required for the 2008 Easton Point Residential Development project since it would disturb more than one acre.  

Mitigation Measure 6.5-1(b) Implement the post-construction BMPs shown on the applicant's Stormwater Control Plan including: detaining the post development increase in peak flow rates,

48 Construction Activity Stormwater General Permits are issued by the State of California Regional Water Quality Control Boards as required by the Clean Water Act, National Pollutant Discharge Elimination System (NPDES) Permit Program.

49 A SWPPP checklist can be found at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/const_swppp.pdf
directing roof runoff and runoff from other future residential impervious surfaces to bioretention areas, and installing Filterra Bioretention Systems in road catch basins. In addition, the applicant shall prepare a Stormwater Control Plan as a stand-alone document, detailing post-project stormwater control measures. A Stormwater Control Plan is required for new residential subdivisions with ten or more lots to comply with Marin County's Phase II Municipal Stormwater NPDES permit. 50 Marin County Code Section 23.18.093, provides additional information on Stormwater Control Plan requirements. The Marin County document, Guidance for Applicants, Stormwater Quality Manual for Development Projects in Marin County 51 should be utilized during preparation of the Stormwater Control Plan. The document provides a Stormwater Control Plan checklist to be utilized during plan preparation. Particular attention should be paid to identifying pollutant sources related to lawn care, and for each pollutant source, a source control measure(s) should be identified for use during the development of each lot to reduce identified pollutants to the maximum extent practicable. Source control measures include:

- An irrigation schedule linked to typical seasonal soil moisture levels.
- Providing residents with a list of specific chemical inputs tested and cleared by the USEPA for application to vegetation.
- Indicate frequency and scheduling of the chemical inputs based on site-specific characteristics (such as soil and vegetative cover and rates of uptake) and the acknowledged sensitivity of downstream receiving waters.
- Include homeowner education information to be incorporated in the project’s CC&Rs to instruct both the owners and their landscaping contractors in safe chemical handling and application procedures.

In addition to requirements outlined in the Guidance for Applicants, Stormwater Quality Manual for Development Projects in Marin County the applicant shall incorporate the following site-appropriate BMPs or their equivalents, in the project Stormwater Control Plan for short- and long-term implementation by the applicant and individual lot owners, in order to comply with the requirements of the Phase II NPDES permit:

- The Property Owners Association (POA) shall privately contract with Mill Valley Refuse Service (MVRS) or its equivalent to undertake monthly street sweeping. MVRS already serves numerous areas on the Tiburon Peninsula.
- The POA shall provide each homeowner with pamphlets or other informative documentation regarding the use of less toxic pest management procedures, including integrated pest management. MCSTOPP.org has related on-line information which also includes descriptions of less toxic pest control products and procedures, the effectiveness of which has been proven in the scientific literature (e.g. see www.ourwaterourworld.org/). The TMDL study on pesticides in urban creeks in the San Francisco Bay Region also references significant recent research into

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50 Marin County permit coverage under the NPDES Phase II General Permit issued by the San Francisco Bay Regional Water Quality Control Board commenced on March 30, 2004. For further information see http://www.mcstoppp.org/newdevresources.htm

pesticide practices and alternatives to limit their migration to surface waters and San Francisco Bay.

- Each residence shall incorporate a bioswale, or other geotechnically appropriate methods for treatment of runoff from the lot's impervious surfaces. The swale location shown on each lot's Conceptual Grading Plan can be used for guidance. Guidelines shall be incorporated into the Stormwater Control Plan from the Stormwater Quality Manual for Development Projects in Marin County for sizing treatment facilities (e.g. bioswales).

**Significance after Mitigation** Implementation of Mitigation Measures 6.5-1(a) and 6.5-1(b) would substantially improve the prospects for minimizing on-site and downstream water quality impacts and would reduce Alternative 2’s impact to a less-than-significant level. The components contained in this measure also represent the best available practical technology for addressing water quality impacts associated with urbanization. Therefore, implementation of Mitigation Measures 6.5-1(a) and 6.5-1(b) would reduce project impacts on water quality to a less-than-significant level.

**Impact 6.5-2 On-Site Drainage Patterns – On-Site and Off-Site Flooding**

Similar to the proposed project, construction of houses, roads, and drainage facilities in Watersheds B through E, J, L, M through P, R, S, V and W under Alternative 2 would cause a minor transfer of runoff across watershed boundaries. Development in these watersheds would result in the capture of road runoff via storm drains, with the release of captured water onto neighboring slopes or into site drainageways.

The project’s geotechnical consultant (Miller Pacific Engineering Group) has proposed a revised stabilization program which delineates the extent of landslide repairs proposed. As proposed, stabilization of the lower portions of Landslide 11 and the unstable colluvial deposit to the north via the installation of subdrains would affect flow magnitudes and durations in Drainageways 2 and 3 in Watersheds J and L. Installation of subdrains below these drainageways would effectively dewater the channels during periods of lower flows when the subdrain system capacities are not reached. The resulting impact on on-site drainage patterns would be the same as that identified for the proposed project and, thus, a less-than-significant impact.

Similar to the proposed project, this alternative includes improvements along Paradise Drive to improve the sight distance at Forest Glen Court and the driveway to Lots 18 through 21, plus at the Remainder Lot driveway. Mitigation Measure 6.1-3 includes additional improvements at Forest Glen Court in regard to providing adequate sight distance. Related grading associated with the two site road intersections with Paradise Drive (Forest Glen Court and the driveway to Lots 18 through 21 are shown on the Alternative 2 grading plan. No similar improvements are shown for the driveway to the Remainder Lot. The EIR hydrologist conducted a walking inspection of the projected road intersections in March 2010 to determine the approximate extent of grading and any potential impacts to site drainage patterns, including Paradise Drive roadway culverts.

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52 Preliminary Geotechnical Report, Town of Tiburon’s 32-Unit Lower Density Alternative, Easton Point Subdivision, Tiburon, California, Dec. 10, 2009. Landslide Exhibit is Sheet GR1, revised 05/26/10.

53 Town of Tiburon’s 32 Units LDA, Grading Plan, Easton Point Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C1A, and C-1B, op. cit.
The potential impacts of hillslope and roadway grading associated with sight distance improvements is discussed in Impact 5.5-2 On-Site Drainage Patterns – On Site and Off-Site Flooding for the proposed project. Impact 5.5-2 does not, however, include an analysis of the Remainder Lot house and driveway. As discussed in Impact 6.1-3 Safety Impact Due to Inadequate Distance Approaching the Unsignalized Intersections of Paradise Drive with Alternative 2 Access Roads sight distance at this intersection would be adequate based on Caltrans standards. Therefore, no additional hillslope grading would be required.

The construction of two of the three proposed on-site trail segments could affect local drainage patterns if these trails are insloped. The segment extending across the site from Spanish Trail to Paradise Drive and portions of the segment that would ultimately occupy the alignment of the construction access road would cross hillslopes (i.e. rather than ridgelines) and could lead to alterations in hillslope drainage patterns, as well as concentration of flows where such runoff was collected and diverted downslope, e.g. a culvert crossing. If the trail segments were not constructed to current standards, such alterations to normal hillslope drainage patterns would constitute a significant impact.

Based on plan sheet interpretation of the likely extent of grading required to provide proper sight distances and the EIR hydrologist’s field inspection, significant impacts to local roadside drainage along Paradise Drive could occur with the projected sight distance grading. Also, care would be required to ensure that the graded hillslope areas were geotechnically stable, and/or were reinforced using retaining walls and that the drainage ditch segments were cleared of any loose material and returned to their previous cross-sections and slopes prior to the following rainy season.

Mitigation Measure 6.5-2 The applicant shall implement the following mitigation measures in order to reduce the project’s impacts on on-site drainage patterns to less-than-significant levels:

Mitigation Measure 6.5-2(a) Following the completion of hillslope and/or roadway grading for sight-line distance improvement, clear stormwater ditch segments along Paradise Drive of extraneous cut material and return ditch cross-sections, slopes and drainage and hydraulic capacities to pre-disturbance conditions. Ensure that roadway culverts are not buried or obstructed by excavation debris.

Mitigation Measure 6.5-2(b) Apply appropriate trail construction guidelines such as those published by California Department of Parks and Recreation “Trail Guidelines” and the East Bay Regional Parks District, among others. In particular, trail design should include outsloping, where possible, to maintain existing drainage patterns and to minimize the alteration of hillslope drainage patterns. Also, any new trail alignments shall be developed in consultation with a geologist or geotechnical engineer to minimize the threat of erosion or slope instability.

Significance after Mitigation Implementation of Mitigation Measure 6.5-2(a) would reduce project sight distance grading impacts on Paradise Drive drainage patterns to a less-than-significant level. Implementation of Mitigation Measure 6.5-2(b) would reduce trail development impacts on on-site drainage patterns to a less-than-significant level.

Impact 6.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation

With Alternative 2, construction of impervious surfaces and storm drain systems in the site’s watersheds would alter site drainage patterns, concentrate stormwater runoff, increase peak flow rates in on-site drainageways and increase the risk of incision and instability in receiving drainageways and
on hillslopes. In addition, grading of lots and roads, constructing lot-based slope stabilization measures (e.g. pier and grade beam walls) and installing utilities would disturb areas of the site and expose bared soil surfaces to the erosive forces of rainfall and runoff. For Alternative 2, the surface areas associated with each of the cited sources of disturbance would be reduced. With respect to lot grading, the 13 lots and associated driveways eliminated from Alternative 2, would reduce the area of impervious surfaces by approximately 14.5 percent. Lot grading envelopes would not be delineated until individual lots are developed. However, the reduction in grading area would likely decrease proportionately. Similarly, the extent of grading associated with proposed landslide stabilization under Alternative 2, including “remove and replace”, buried drilled pier and grade beam, and subdrain construction, would be reduced, albeit slightly (two percent) compared with the proposed project (3.45 versus 3.52 acres).

The proposed construction access road would be built through Parcel A, extending west-southwest from the existing MMWD water tank (off Forest Glen Court) to the intersection with Water Tank Road, immediately south of the proposed water tank. Removal of the construction access road and its conversion to a hiking trail would likely occur within five to ten years of the completion of site preparation. The exact timing would be linked to construction progress and the issuance of certificates of occupancy for a prescribed number of homes per the draft Development Agreement. The construction access road would be paved and be fitted with guard rails and turnouts. Also, while the construction access road design does not show a runaway truck ramp, Mitigation Measure 6.1-13 specifies that such a ramp be provided. Depending on the timing of the eventual road removal and trail construction, additional erosion and downstream sedimentation impacts could occur within Parcel A watershed areas, as well as including Keil Pond. However, with proper planning and completion of both activities, as well as erosion control measures, during the same construction season (late April-early October), erosion and sedimentation impacts could be minimized.

The additional hillslope grading associated with proposed improvements to sight distance at Alternative 2’s three roadway intersections with Paradise Drive would result in deposition of some cut (or dry ravel) material in Paradise Drive roadside ditch segments (see full discussion under Impact 5.5-2 On-Site Drainage Patterns – On Site and Off-Site Flooding and Impact 6.5-2 On-Site Drainage Patterns – On Site and Off-Site Flooding). If such material were allowed to remain in the roadside ditches, down-gradient culvert inlets along Paradise Drive could become obstructed, resulting in reduced stormwater conveyance capacity and possible premature sheet flooding across Paradise Drive.

In addition to the ridgeline trail, converted from the construction access road, two trails are proposed as part of Alternative 2. The trail that would parallel Ridge Road, then the Water Tank Road is aligned primarily with a very mildly sloping ridgeline segment and poses little risk of erosion and downstream sedimentation. However, construction or improvement of the trail segment that would parallel the hillslope contour from the end of Spanish Trail to Paradise Drive, just south of the Remainder Lot, could create opportunities for localized erosion unless proper trail drainage design were applied. Since the trail alignment crosses the inherently unstable terrain of Watersheds J and L (i.e. mapped as landslides by applicant’ geotechnical engineer), minor incidences of erosion could develop into more serious slope failures, with attendant repercussions for downstream sedimentation.

Alternative 2, although reduced in its extent of grading disturbance, could result in local and downslope soil erosion, downstream sedimentation and obstruction of hydraulic structures (culverts and catch basins), as well as increase the risk of sedimentation in Keil Pond and Railroad Marsh. These would be significant erosion and sedimentation impacts.

Alternative 2, as with the proposed project, would incorporate on-site stormwater detention facilities to accomplish:
• Maintenance of peak flow rates for the ten-year to 100-year post-development rainstorms to that of the pre-development ten-year rainstorm; and

• Detention of differential runoff volumes for the pre- and post-development conditions during the design 100-year rainstorm.

Depending on the design of the outlets at the detention facilities, post-project peak flow rates and runoff volumes for storm events of lesser magnitudes (e.g. less than ten-year recurrence intervals) could increase enough to induce drainageway scour and incision. The 1.5- to two-year watershed discharge is commonly referred to as the “channel forming” discharge for this reason. Such incision could increase local hillslope instability, potentially inducing movement in landslides not subject to full repair (i.e. remove and replace treatment) under Alternative 2’s stabilization plan. Downstream sedimentation of culvert inlets under Paradise Drive could also increase episodically in response to this form of more gradual channel adjustment. Consequently, the increase in post-development watershed discharges could have a significant impact on erosion and sedimentation in site drainageways and at Paradise Drive culverts.

Alternative 2’s impact on erosion and sedimentation would be less than for the proposed project, but would remain significant.

Mitigation Measure 6.5-3 The applicant shall implement the following mitigation measures in order to reduce the project’s erosion and downstream sedimentation impacts to less-than-significant levels:

Mitigation Measure 6.5-3(a) The applicant shall implement Mitigation Measure 6.5-1(a) which includes applying for coverage under the NPDES Construction Activity General Permit for construction activities that disturb more than one acre. The applicant shall add a provision to the project’s CC&Rs stating that the POA would be responsible for ensuring that the developer of each lot be required to meet all conditions specified in the General Permit. This would ensure that appropriate erosion control and water quality mitigation measures are implemented at the time each lot is developed.

Mitigation Measure 6.5-3(b) The applicant shall implement Mitigation Measure 6.5-1(a), which requires the applicant to prepare a Stormwater Pollution Prevent Plan (SWPPP), and Mitigation Measure 6.5-1(b), which requires the applicant to prepare a stand-alone Stormwater Control Plan. The SWPPP would include specific measures to reduce the potential for erosion and downstream sedimentation during construction, paying particular attention to the construction access road. The Stormwater Control Plan shall include specific measures to reduce the potential for erosion and downstream sedimentation once the project is constructed. See Mitigation Measures 6.5-1(a) and 6.5-1(b) for additional information regarding the necessary measures to reduce the potential for erosion and sedimentation during construction and after project completion.

Mitigation Measure 6.5-3(c) Any areas receiving point discharge from subdrains or detention facilities shall be protected by means of appropriately sized rip rap energy dissipators and / or velocity reducers to control the discharge and protect against slope erosion. A geomorphic evaluation shall be conducted for each point discharge location to ensure that increased peak flow rates, up to the ten-year storm event, would not impact hillslope or drainageway stability at the point of discharge and downslope / downstream. Rip rap may be required around bubble-up boxes to prevent erosion.

54 The ten-year pre-project peak flow rate at each discharge point would be maintained for the ten-year to 100-year post-project design storm.
Level spreaders shall be installed with as little disturbance of downslope areas as possible and installed in a manner to ensure proper distribution of flow across the spreader. Due to the steep site slopes leading down to and below the proposed location of level spreaders, the level spreaders would likely need to be composed of a pipe with evenly placed weep holes drilled through the pipe. The spreader pipe would be placed on contour for even discharge onto the hillslope. Maintenance procedures for clearing sediment from the spreaders shall be established and transferred to the POA. (For its reference in maintaining erosion control measures see Mitigation Measure 6.5-1(b) requirements for the project’s Stormwater Control Plan detailing post-project stormwater control measures).

**Mitigation Measure 6.5-3(d)** Implement Mitigation Measure 6.5-2(b) to ensure the drainage integrity of inslope roadside ditch segments along Paradise Drive following the completion of hillslope grading for sight-line improvement.

**Mitigation Measure 6.5-3(e)** Implement Mitigation Measure 6.5-2(c) to minimize trail development impacts on erosion, hillslope/drainageway instability and downstream sedimentation.

**Mitigation Measure 6.5-3(f)** For final design of site stormwater runoff detention facilities, position the outlet to provide a runoff storage volume sufficient to mitigate for the volume differential between the pre- and post-development two-year rainstorm, i.e. before any outlet flow occurs. This feature would expand the detention function, but would not substantially change the overall design of the structure, since the outlet capacity would remain the targeted ten-year, pre-development peak flow and the total volumetric storage would satisfy the 100-year storm requirement.

**Significance after Mitigation** Implementation of Mitigation Measure 6.5-3 would reduce the project’s impacts on erosion and downstream sedimentation to a less-than-significant level. The measure’s provisions also would ensure incorporation of the best practical measures for site erosion control.

**Impact 6.5-4  Groundwater Recharge and On-site Hydrology**

Both the extent of “remove and replace” landslide stabilization and the number of residential lots proposed under *Alternative 2* would be reduced in comparison with the proposed project. However, stabilization actions required to stabilize existing landslide deposits under *Alternative 2* could still impact three seeps in Watershed J, one seep and a seasonal pond in Watershed L, the seep on the north side of Drainageway 1 in Watershed E, and the spring in Watershed C, by reducing or eliminating the seasonal extent of groundwater recharge to these features. In addition, the lower reaches of the Drainageways 2 and 3 may be dewatered through the installation of subdrains below the drainageways as part of the proposed landslide stabilization measures. Any changes in the seasonal hydrology (i.e. duration and extent) of these on-site hydrologic features, while potentially detrimental to on-site wetland features, would result in less-than-significant impacts. For a more detailed discussion of the physical mechanisms involved and the nature of these impacts, see *Impact 5.5-4 Groundwater Recharge and On-Site Hydrology*. Since Keil Spring represents an in-holding within the project site, i.e. is part of the Keil property, it is treated as an off-site hydrologic feature and related impacts to Keil Spring are discussed in *Impact 6.5-5 Groundwater Recharge and Off-Site Hydrology* and in *Impact 6.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-Based Water Supply*.

Although the existing natural hydrology of site seeps, springs, the seasonal pond, and the drainageways in Watersheds C, E, J, and L would be altered due to the implementation of the landslide...
stabilization plan, the impact of Alternative 2 on groundwater recharge and on-site hydrology would be less-than-significant.

**Mitigation Measure 6.5-4** No mitigation would be required.

**Impact 6.5-5  Groundwater Recharge and Off-Site Hydrology**

Landslide repair and improvements required to stabilize existing slopes for the construction of homes could result in impacts to springs and seeps at the project site and/or conversion of site groundwater to surface water. Implementation of Alternative 2 would slightly reduce the impact on Keil Spring compared to the proposed project, due to the elimination of upstream lots. As shown on the landslide stabilization plan for Alternative 2 (see Exhibit 6.0-34), the extent of repair for Landslide 11 would be reduced and there would be no need for repair to Landslide 13. These revisions would lessen the hydrologic impact on Keil Spring. However, the installation of subdrains for dewatering of unstable landslides, localized lot stabilization (i.e. associated with buried drilled pier and grade beam installations, plus maintained repair and replace landslide treatments), and retaining wall construction and drainage, particularly in Watersheds C, E through H, J and L, would remain an integral part of the hillslope stabilization program for site development. However, aside from the project impacts to the off-site Keil water supply (see Impact 6.5-6) the upslope conversion of groundwater to surface water would be a less-than-significant impact to off-site hydrology, including on the Keil property and the adjoining properties to the south (outlet for Drainageway 1), under Alternative 2.

For Alternative 2, a proposed sub-drain installation and “repair and replace” treatment of Landslide 2 in the upper Railroad Marsh Watershed (Site Watershed C) could impact existing spring and seep zones just downstream from the western project boundary. These off-site seeped areas occur along the upper portions of this small, moderately incised drainage, but are not mapped in Exhibit 5.5-1, which is limited to on-site hydrologic features. Compared to the proposed project, the localized infiltration and groundwater recharge impacts of lot development and hillslope stabilization in Watershed C would have a significant yet decreased impact on these off-site seep zones and the duration of seasonal flow in the ephemeral drainage that is sustained by groundwater discharge. Since these creekside seeped zones are localized features, i.e. do not substantially affect groundwater relationships downgradient, the partial alteration of the upslope groundwater recharge area would expectedly have a less-than-significant impact on the hydrology of Railroad Marsh.

Elsewhere within Alternative 2’s development area, including Watershed E and the watersheds that drain north toward Central San Francisco Bay (i.e. Watersheds Q through Z and AA), impacts to off-site hydrology would be similar to those cited for the proposed project. However, no critical habitat functions or groundwater resources would be affected by the alterations of site terrain associated with Alternative 2. Thus, the impacts of Alternative 2 on groundwater recharge and off-site hydrology for these watersheds would be less-than-significant with the applicant’s proposed detention facilities.

As noted in the more detailed discussion under Impact 5.5-5 Groundwater Recharge and Off-Site Hydrology for the proposed project, both the projected areal extent and depth of landslide remediation would be subject to adjustment once the initial slide excavation occurs (see Impact 6.4-1 Landsliding). Thus, the extent and degree of the stabilization impacts could be greater or less than that projected by the applicant’s geotechnical engineer. In summary, the level of impact of Alternative 2’s implementation would be either significantly less (Keil Spring) or slightly less (Keil property groundwater cisterns, Railroad Marsh tributary and seeped zones) than for the proposed project due to both the reduction in the extent of remove and replace landslide stabilization in Watersheds J and L and the elimination of the 13 residential lots.
**Mitigation Measure 6.5-5** No mitigation would be required.

**Impact 6.5-6  Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply**

*Alternative 2’s* development would result in the elimination of residential lots formerly designated along Water Tank Road, as well as a reduction in the extent of repair and replace landslide stabilization (e.g. Landslides 11 and 13 in Watersheds J and L) relative to the proposed project. Thus, under *Alternative 2*, the significant impact on Keil Spring and its contribution to the Keil property water supply cited for the proposed project would be substantially reduced.

Under *Alternative 2*, landslide repair or improvements required to stabilize existing landslide deposits would convert on-site groundwater to surface water. While the extent of repair and replace stabilization would decrease relative to the proposed project, the extent of subdrain installation, either as stand-alone dewatering features or in association with remaining replace and repair stabilization, buried drilled pier and grade beam, and retaining wall construction sites, would remain similar to that of the proposed project. Moreover, the construction of impervious surfaces in the form of pavement and roof coverage, while somewhat less than that for the proposed project, would eliminate areas of existing groundwater recharge. LID measures proposed by the applicant’s hydrology and geotechnical consultants, while beneficial, would not compensate for the groundwater lost to on-site conversion to surface discharge. These impacts would reduce the available water supply to the groundwater cisterns located on the Keil property. A reduction in the available water supply to the cisterns could result in a reduction in the availability of this historic water supply to the Keil property. Such a reduction in the groundwater discharge to the Keil property cisterns would decrease the reliability or a significant portion of the historical groundwater supply used for irrigation of historically significant gardens and would result in a significant impact.

Site construction and landslide/hillslope stabilization activities associated with *Alternative 2* could result in damage to or displacement of the pipeline conveying Keil Spring discharge to the irrigation water supply on the Keil property. Construction of the trail segment across Parcel A, albeit with less reliance on large mechanized equipment, could also damage this conveyance pipe and cause a temporary disruption in Spring water delivery. Although this risk is avoidable with proper pre-construction planning, it would be a significant impact on the Keil spring-based water supply.

The impact of *Alternative 2* would remain significant, but would also represent a substantial improvement over the proposed project, due to the removal of residential lots and related improvements upslope of Keil Spring, within the probable zone of groundwater recharge.

**Mitigation Measure 6.5-6** The applicant shall implement the following measures in order to reduce the project’s impact on Keil Spring and the Keil property spring-based water supply:

**Mitigation Measure 6.5-6(a)** Install a water conveyance distribution system to link the landslide improvement area subdrains with the Keil property’s existing water supply system. Depending on hydraulic constraints, this converted drain water could be conveyed to either the upslope redwood storage tank or the cisterns. Since all Keil property water system components are linked by piping and pumps, a link to the upper redwood storage tank would probably suffice. Implementation of this mitigation measure would require the agreement and cooperation of the owners of the Keil property.

**Significance After Mitigation** Construction of a water conveyance system to convey converted on-site groundwater discharge to the off-site Keil water storage structures (Mitigation Measure 6.5-6(a))
would reduce project impacts to depleted groundwater supplies and the Keil property cisterns and spring-based groundwater supply to a less-than-significant level.

**Impact 6.5-7 On-site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection**

Under Alternative 2, 11 fewer residential lots would be developed, resulting in a decrease in impervious surface coverage relative to the proposed project. However, the remaining 32 residential lots would still increase the rate and quantity of runoff leaving the project site. Future development of individual lots would increase peak flow rates conveyed off-site by the culverts beneath Paradise Road and in the storm drain system beneath the Hill Haven neighborhood. Uncontrolled increases in peak flow rates would result in potentially significant impacts. The applicant’s Drainage Report proposes the use of detention facilities to maintain pre-project peak flow rates, eliminate potential impacts to existing and downstream storm drain capacities, and protect against downstream flooding. Implementation of the detention measures included in Drainage Report, as quantified by the EIR hydrologist, would mitigate development related increases in peak flows and runoff volumes for rainstorms with recurrence intervals equal to or exceeding ten years.

As described above in the Peak Flow Assessment for Alternative 2, the applicant's revised Drainage Report and associated calculations document pre- and post-project peak flow rates and detention volumes required to maintain pre-project peak flow levels. The EIR hydrologist conducted a peer review of the document and calculations, and completed separate calculations for peak flow rates and detention facility sizing. The results of these calculations are presented in Exhibit 6.0-35. The detailed calculations and a summary of the methodology are contained in the Appendix. As described in the revised Drainage Report, detention facilities have been sized to store the volume differential between the pre- and post-project 100-year design rainstorm. The stored volume would then be slowly released, by use of a metering device such as an orifice, at no greater than the ten-year, pre-project peak flow rate. Therefore, the detention facilities would serve this attenuating function for storms with recurrence intervals between ten and 100 years.

During the final design phase of the project drainage system, detention facility outlet controls (e.g. orifices) would be sized to meet the ten-year, pre-project peak flow release requirement. Outlet controls cannot be sized until the dimensions of the detention facilities are known, since outlet sizing is a function of detention facility dimensions.

As noted under the discussion of Impact 5.5-7 On-Site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection, some of the culverts below Paradise Road do not have sufficient capacity to pass the existing 100-year peak flow. However, since the on-site detention facilities would be appropriately sized to maintain maximum peak flow rates at the ten-year, pre-development levels, the impact of Alternative 2 would be similar to that of the proposed project.

As noted in the above discussion under Impact 6.5-3 Site Drainage Patterns - Erosion and Sedimentation, the broadly defined detention facilities suggested in the revised Drainage Report would not necessarily mitigate for any increases in peak flows for lesser rainstorms, i.e. less than ten-year events. Post-development increases in peak flow rates and flow volumes during these more frequent runoff events could trigger channel changes, including incision and bank instability/channel widening. Such channel adjustment would yield increased quantities of sediment downstream,

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possibly obstructing Paradise Drive culverts and reducing their capacities. This could increase the likelihood of localized sheet flooding over Paradise Drive, which would constitute a significant impact.

In summary, Alternative 2 would have a reduced, yet similarly significant impact on peak flow rates, existing storm drain capacities and flooding.

**Mitigation Measure 6.5-7** Implement Mitigation Measures 6.5-3(c), (d), (e) and (f) to minimize increases in peak flows and runoff volumes during rainstorms with two-year to ten-year recurrence intervals, and/or to minimize the risk of drainage instability, downstream sedimentation, culvert blockage and local flooding. As proposed, the applicant’s detention facilities would mitigate for project increases in the ten-year to 100-year design storm events.

**Significance After Mitigation** With implementation of Mitigation Measure 6.5-7, Alternative 2’s impacts on peak flow rates, existing storm drain capacities and flooding would be reduced to a less-than-significant level.

**BIOLOGICAL RESOURCES**

**No or Less-Than-Significant Impacts**

Impacts that were initially determined to be less-than-significant for the proposed project that would also be less-than-significant for Alternative 2 include: loss of habitat for special status animals (except California red-legged frog (CRLF), see Impact 6.6-2 Impacts to the California Red-Legged Frog below); interference with the movement of native wildlife (except CRLF, see Impact 5.6-2 below); loss of habitat for native wildlife; and indirect impacts to native wildlife from house cat predation.

Under Alternative 2, the construction access road would be considered a temporary project feature and would eventually be removed. The area within the footprint of the road would be revegetated or otherwise made suitable for a hiking trail. Impacts as a result of the construction of the road are evaluated for the proposed project in Section 5.6 Biological Resources and determined to result in the loss of primarily non-native grassland and scrub habitats, the loss of which would be less-than-significant for the proposed project. The construction access road would result in the loss of some woodland habitat occurring near the terminus of Forest Glen Court, which along with other woodland losses is evaluated for the proposed project and considered significant (see Impact 5.6-4 Loss of Coast Live Oak Woodland). The removal of the construction access road in Alternative 2 would therefore not result in any new impacts not already evaluated for the proposed project. However, the removal of the road would likely result in some new temporary impacts to those habitats occurring adjacent to it, but these areas, as well as areas within the footprint of the removed road outside of any permanent trail alignment would be revegetated and therefore, no new impacts would occur.
**Exhibit 6.0-37** summarizes the estimated impacts to the habitat types on the project site for Alternative 2. **Exhibit 6.0-37** also shows the estimated impacts for the proposed project. **Exhibit 6.0-38** illustrates proposed residential lots (including building sites and building footprints), roads and landslide repairs for Alternative 2 in relation to the site’s habitat types.

### Exhibit 6.0.37
**Estimated Impacts to Habitats on the Site**

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Existing Conditions</th>
<th>Impact Area Project</th>
<th>Impact Area Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>acres</td>
<td>percent</td>
<td>acres</td>
</tr>
<tr>
<td>Coast Live Oak</td>
<td>47.71</td>
<td>43.4</td>
<td>12.82</td>
</tr>
<tr>
<td>Non-Native Grassland (non-serpentine)</td>
<td>38.70</td>
<td>35.2</td>
<td>15.46</td>
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<tr>
<td>Serpentine Bunchgrass 57</td>
<td>11.31</td>
<td>10.3</td>
<td>9.44</td>
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<tr>
<td>Marin Dwarf Flax</td>
<td>2.25</td>
<td>n/a</td>
<td>1.67</td>
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<tr>
<td>Serpentine Reed Grass</td>
<td>0.08</td>
<td>n/a</td>
<td>0.06</td>
</tr>
<tr>
<td>Non-Native Grassland (serpentine)</td>
<td>0.85</td>
<td>0.8</td>
<td>0.85</td>
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<tr>
<td>Northern Coyote Brush Scrub</td>
<td>10.33</td>
<td>9.4</td>
<td>6.34</td>
</tr>
<tr>
<td>Freshwater Wetland / Aquatic</td>
<td>0.94</td>
<td>0.9</td>
<td>0.01</td>
</tr>
<tr>
<td>Developed</td>
<td>0.16</td>
<td>0.2</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Source: Live Oak Associates, 2010

**Impact 6.6-1 Impacts to Special Status Plants**

With Alternative 2, development and long-term use of Lots 1, 4, 6, 7, and 17 as well as the construction of the hiking trail from Ridge Road to Old St. Hilary’s Open Space Preserve, would impact 0.48 acres (21.3 percent) of Marin dwarf flax habitat on-site (as mapped during 2009), compared to 1.67 acres (74.7 percent) of dwarf flax habitat that would be impacted under the proposed project (see **Exhibit 6.0-37**).

With Alternative 2, development and long-term use of Lot 6 and the portion of the hiking trail below Lot 4 would impact 0.01 acres (12.5 percent) of serpentine reed grass habitat on-site (as mapped during 2009), compared to 0.06 acres (75.0 percent) of such habitat impacted under the proposed project. The remainder of habitat for Marin dwarf flax and serpentine reed grass, 1.77 acres (78.7 percent) and 0.07 acres (87.5 percent), respectively, would be preserved in perpetuity within Parcels A and B, proposed for dedication to the MCOSD. Therefore, with Alternative 2, a preservation:loss ratio of greater than 3:1 would be achieved for both plant species.

Additionally, with Alternative 2, Parcel B in which the majority of the Marin dwarf flax population would be preserved on-site would be immediately adjacent to and contiguous with the portion of the dwarf flax population occurring on Old St. Hilary’s Open Space Preserve, as opposed to being isolated from that portion of the population under the proposed project. This latter change under Alternative 2

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56 Habitat and impact calculations were developed by the EIR biologists based on PDP CAD files provided by the applicant. Wetland impact calculations are estimated based on the location of landslide repairs near the wetland area on Lot 16.

57 Acreages of Marin dwarf flax and serpentine reed grass habitat is included in the serpentine bunchgrass habitat acreage.
Alternative 2 - Biotic Habitats and Proposed Development

Source: Live Oak Associates, December 14, 2010

Habitats:
- Coast Live Oak Woodland
- Serpentine Bunchgrass
- Non-native Grassland (serpentine)
- Non-native Grassland (non-serpentine)
- Non-native Grassland (non-serpentine) with Significant Component of Native Grasses
- Northern Coyote Brush Scrub
- Seasonal Wetland
- Seep *
- Spring *
- Seasonal Pond *
- Marin Dwarf Flax (Hesperolinon congestum)
- Serpentine Reed Grass (Calamagrostis ophitidis)
- Developed
- Areas not included in habitat acreage calculation

Other:
- Project Boundary
- Seasonal Drainageway
- Building Sites
- Landslide Repairs
- Remove and Replace
- Buried Drilled Pier and Grade Beam Walls
- Subdrains
- Debris Fence

Source: Live Oak Associates, December 14, 2010
would also facilitate access to the portion of the on-site population within Parcel B for purposes of monitoring and managing the protected population.

Lastly, with Alternative 2, Lot 2 has been reconfigured so that it is unlikely that special status plant species occurring on Old St. Hilary’s Open Space Preserve within 100 feet of the project site boundary (i.e. Marin dwarf flax, Tiburon jewel-flower, Tiburon Indian paintbrush and Carlotta Hall’s lace fern) would be indirectly impacted by landscape irrigation runoff, or the downdrift of landscape chemicals (herbicides, fertilizers) and non-serpentine fill and/or topsoil’s.

While the majority of the populations of special status plants occurring on-site would be preserved in Parcel A or B, the applicant has made no provision for the development or funding of a Resource Management Plan to monitor and manage these populations. In the absence of such a plan, it is likely that remaining populations may be directly or indirectly impacted over time by such activities as trampling by humans or pets, and that all or some of the remaining population may be lost. The direct or indirect loss of special status plants as a result of project development or over time as a result of use of the site by individual lot owners would be a significant impact.

Although this remains a significant impact with Alternative 2, this impact would be less than under the proposed project.

Mitigation Measure 6.6-1 The applicant shall implement the following mitigation measures to reduce impacts to special status plants:

Mitigation Measure 6.6-1(a) Ensure the in perpetuity preservation of special status plant habitat remaining after project development:

- The applicant shall dedicate preserved populations of Marin dwarf flax and serpentine reed grass on-site (Parcel A and Parcel B) to the MCOSD. However, should no agreement be reached with the MCOSD regarding such a dedication, then the applicant shall dedicate these parcels to public agency or non-profit approved by Marin County as determined in consultation with all applicable resource agencies (CDFG and USFWS) for control and management.

- As an alternative to fee title dedication of all or any portion of Parcel A or Parcel B and with the approval of Marin County, the POA may retain ownership of these parcels, or any portion of these parcels and dedicate a conservation easement to a public agency or non-profit approved by Marin County, in consultation with all applicable resource agencies (CDFG and USFWS). Any such parcel(s) shall be subject to the same Resource Management Plan as Parcel A and B (see Mitigation Measure 6.6-1(b) below).

- Provide minimum setbacks from preserved populations of these species occurring on-site or off-site on Old St. Hilary’s Open Space Preserve to ensure these populations are not indirectly impacted by landscape irrigation run-off, or downdrift of landscape chemicals or non-serpentine fill or top soils. The minimum setback for all lots that occur adjacent to and upslope from off-site or on-site populations (as mapped in 2009) shall be 100 feet from the edge of the off-site population or the edge of populations preserved on-site within Parcel A or B to the closest lot building and landscape envelope. The minimum setback for all other adjacent lots shall be 50 feet from the edge of the off-site population or the edge of populations preserved on-site within Parcel A or B to the closest lot building and landscape envelope.
Mitigation Measure 6.6-1(b) Ensure the in perpetuity preservation and management of special status plant habitat remaining after project development:

- The applicant shall develop and implement a Resource Management Plan (RMP) for all sensitive habitats (special status plant habitat, CRLF habitat, native bunchgrass habitat, woodland habitat, and wetlands) preserved within Parcels A and B (or any other parcels created for the purpose of habitat preservation as stated in Mitigation Measure 6.6-1(a)). Marin County CDA Planning Division shall review and approve the RMP in consultation with the MCOSD and all applicable agencies (CDFG, USFWS, USACE, etc.). The RMP shall be written by a qualified biologist with expertise in the various sensitive resources to be covered by the RMP. At a minimum, the RMP shall include the following:

  - Allowed and prohibited activities on preserved lands.
  - The locations and types of any fencing, signs and/or displays to be constructed on preserved lands.
  - A monitoring and management plan for non-native and/or invasive species, or pathogens, considered detrimental to protected resources (weed abatement, invasive species removal, SODS management, CRLF predator control, etc.).
  - The types and frequency of any maintenance activities to be conducted on preserved lands (litter removal, fence or sign repairs, etc.).
  - A Fuel Management Plan element to ensure that vegetation on preserved areas and adjacent private lots within the project site would be maintained consistent with all current and future fire safety guidelines. The plan shall include provisions for mitigating woodland impacts as a result of fuel management activities through woodland enhancement in unaffected areas of the site.
  - A mitigation, monitoring and management plan for any sensitive habitats to be restored or created on preserved lands (wetlands, CRLF habitat, etc.) as required by the EIR mitigation measures or that may be required as a result of permit conditions of regulating agencies. The plan shall include the extent of the monitoring period, quantifiable performance measures and success criteria; an adaptive management component with remedial measures should performance measures fall short of success criteria; quantifiable final success criteria; and a once-annual report of findings to be provided to the County and any applicable resource agencies.
  - A monitoring plan to monitor the condition of resources occurring on preserved lands and adjacent private lots within the project site. This monitoring plan would help the responsible public agency or non-profit determine if private landowners are engaging in activities which are prohibited under the CC&Rs, and which are having adverse affects on adjacent preserved resources. A component of the monitoring plan would be to ensure that adjacent private lot owners within the project site are managing vegetation on their lots consistent with any current and future fire safety requirements. The plan would include a provision for a once-annual meeting between the POA and the responsible public agency or non-profit staff to discuss results of these monitoring activities and necessary remedial measures.
- Clearly stated short-term and long-term responsibilities of the applicant, the POA, and the MCOSD or other approved public agency or nonprofit for the implementation and funding of the RMP.

- Determine a mechanism by which the Resource Management Plan shall be funded in perpetuity in consultation with Marin County, the MCOSD or other approved public agency or non-profit, and all applicable agencies (CDFG, USFWS, USACE, etc.). Such a mechanism would be the establishment by the applicant of a non-wasting endowment, funded by the applicant and/or through monthly POA fees.

**Significance after Mitigation**  Implementation of Mitigation Measure 6.6-1(a) and (b) would reduce this impact to a less-than-significant level.

**Impact 6.6-2  Impacts to the California Red-Legged Frog**

With *Alternative 2*, coast live oak woodland and drainage habitat that may provide foraging and dispersal habitat for the California red-legged frog (CRLF) would be permanently or temporarily impacted, and at project buildout may result in barriers that inhibit dispersal movements of the frog. Preservation of such habitat within Parcel A under *Alternative 2* would be insufficient to off-set these impacts.

With *Alternative 2*, 9.98 acres of coast live oak woodland (20.9 percent) occurs within lot envelopes designated for home building and landscaping. Additionally, the new hiking trail alignment proposed under *Alternative 2*, extending from the southeast corner of the site up to Paradise Drive near the proposed driveway for the Remainder Parcel, would result in additional losses of this habitat. The portion of the trail from the southeast corner up to Drainageway 3 (approximately 2,350 linear feet) would follow an existing dirt road alignment and would not be expected to result in new impacts. Beyond Drainageway 3, the proposed trail would leave the existing alignment and would permanently impact another estimated 0.09 acres of woodland habitat. Temporary impacts to this habitat as a result of trail construction also would be likely to occur.

With *Alternative 2*, 24.29 acres (50.9 percent) of woodland habitat would be preserved in Parcel A proposed for dedication to the MCOSD, resulting in a preservation:loss ratio of only 2:1 for woodland habitat, as opposed to 35.60 acres (74.6 percent), or a preservation:loss ratio of 3:1, under the proposed project.

As with the proposed project, under *Alternative 2*, lots in the Forest Glen area of the project site, at project buildout, would likely create a barrier between on-site woodlands and drainages occurring to the south of such lots and those on-site and off-site woodlands and on-site drainages occurring to the north. Additionally, under *Alternative 2*, no connectivity would be preserved in Parcel A between woodlands occurring on-site to the southeast of the Remainder Lot and those woodlands occurring off-site to the northwest. Although woodlands outside the building and landscaping envelopes are designated on the Remainder Lot as Natural Areas that are to remain undifferentiated from the surrounding preserved habitat of Parcel A, there is no provision made for access to these privately-owned Natural Areas to monitor these areas and ensure that they are not impacted over time by individual lot owners. In effect, if *Alternative 2* is not redesigned to maintain the currently existing connectivity between all on-site and adjacent off-site woodlands and preserve this connectivity in perpetuity within Parcel A, CRLF habitat preservation credit would be restricted to only those preserved woodlands in the southeastern portion of the site that would continue to have connectivity to the only known CRLF breeding habitat in the vicinity at Keil Pond. In the latter case, the
preservation:loss ratio for CRLF dispersal and foraging habitat would be much lower than the aforementioned 2:1 ratio. The loss of CRLF dispersal and foraging habitat in the absence of adequate preservation of such habitat at a 3:1 preservation:loss ratio and the preservation of minimum woodland dispersal corridors within Parcel A would be a significant impact.

This impact would be greater than for the proposed project.

**Mitigation Measure 6.6-2**  The applicant shall implement all of the following mitigation measures:

**Mitigation Measure 6.6-2(a) Avoid impacts to CRLF dispersal movements:**

- Redesign *Alternative 2* to provide connectivity via a minimum 100-foot wide woodland corridor between all on-site and off-site woodland and drainage habitats and known CRLF breeding habitat at Keil Pond. Such corridors shall be preserved in Parcel A to be dedicated to the MCOSD, or another public agency or non-profit, to be managed and preserved in perpetuity. The corridor area could be contained within the private use area of individual lots outside of any building site areas with a permanent conservation easement established and granted to the MCOSD or other public agency or non-profit; or could be incorporated into Parcel A for dedication to the MCOSD or public agency or non-profit. Under either option, the corridor shall be monitored and managed pursuant to the RMP.

- If the redesign of the PDP to provide for a 100-foot corridor is not feasible, then the applicant shall create wetland habitat on-site, or enhance the existing wetland near the top of Drainageway 2, such that these wetland habitats function as on-site breeding habitat for CRLF. The project would result in impacts to drainageways that likely would be considered jurisdictional waters of the U.S. and State as the result of the installation of subdrains and debris fences; as well as to wetlands as the result of the installation of a buried pier and grade beam wall on Lot 16 and the de-watering of the spring on Lot 8 (see *Impact 5.6-5 Disturbance to Jurisdictional Waters*). Creating or enhancing habitat at a minimum of a 2:1 ratio to mitigate impacts to jurisdictional waters simultaneously could contribute towards alleviating impacts on California red-legged frogs via the exchange of lesser quality foraging and dispersal habitat occurring on the northern portion of the site for higher quality breeding habitat.

**Mitigation Measure 6.6-2(b) Compensate for a loss of CRLF habitat:**

- Redesign *Alternative 2* to preserve CRLF foraging and dispersal habitat on-site at a minimum 3:1 preservation:loss ratio within Parcel A.

- If the on-site preservation of CRLF habitat at a 3:1 (preservation:loss) ratio is not feasible, the applicant shall make up any difference in the ratio by purchasing and preserving CRLF habitat off-site in the project region and establishing a conservation easement on the site. A CRLF Mitigation Plan would need to be developed, implemented and funded for the off-site preserved lands as per the same requirements contained in Mitigation Measure 5.6-1(c). This area should be of sufficient acreage and suitable for the frog and would need to be approved by Marin County and the applicable resource agencies (USFWS, CDFG) as suitable for replacing lost foraging and dispersal habitat.

**Mitigation Measure 6.6-2(c) Ensure the in perpetuity preservation of CRLF habitat remaining after project development:**
• The applicant shall dedicate all preserved CRLF habitat on-site (Parcel A) to the MCOSD. Should no agreement be reached with the MCOSD regarding such a dedication, the applicant shall dedicate the parcel to a public agency or non-profit approved by Marin County as determined in consultation with all applicable resource agencies (CDFG and USFWS) for control and management.

• Design, build, and operate the project in order to maintain the water quality in downstream drainage channels and off-site ponds by developing Best Management Practices (BMPs) appropriate for the project (including and consistent with Mitigation Measure 6.5-1 and 6.5-3), which are designed to reduce project impacts to downstream waters to a less-than-significant level.

**Mitigation Measure 6.6-2(d)** Ensure the in perpetuity preservation and management of CRLF habitat remaining after project development by developing, implementing and funding an RMP as set forth in Mitigation Measure 6.6-1(c).

**Mitigation Measure 6.6-2(e)** Ensure that individual CRLFs are not harmed or killed during project construction by preceding development within the woodland habitats and occurring within 300 feet of any drainageway by pre-construction surveys conducted within 48 hours of initial disturbance activities. For all activities occurring within the bed or bank of drainageways, daily construction monitoring by a qualified biologist will be required to ensure that CRLFs are not harmed or killed.

**Significance after Mitigation** Implementation of Mitigation Measures 6.6-2(a) through 6.6-2(e) would result in the in perpetuity preservation and management of CRLF foraging and dispersal habitat at a minimum preservation:loss ratio of 3:1. It would also eliminate or reduce the likelihood of individual CRLF being harmed or killed during project construction. As such, when implemented together, these mitigation measures would reduce impacts to CRLF to a less-than-significant level.

**Impact 6.6-3 Loss of Serpentine Bunchgrass**

With Alternative 2, 5.59 acres (49.4 percent) of serpentine bunchgrass habitat would occur within the individual lots. Although some of this habitat occurs within lot areas designated under Alternative 2 as Natural Areas, it is considered likely that such habitat would be substantially altered or completely lost as a result of project implementation or use of these areas by individual property owners over time. As discussed for the proposed project, the EIR biologists are aware of very few examples where a sensitive habitat has been adequately protected in this manner. Therefore, under Alternative 2, it is assumed that 5.59 acres of serpentine bunchgrass habitat would eventually be lost as compared to 9.44 acres (83.5 percent) under the proposed project. With Alternative 2, the remaining 5.72 acres would be preserved within Parcel A or B, a preservation:loss ratio of just under 2:1. The loss of 5.59 acres of such habitat in the absence of a minimum 3:1 preservation:loss ratio would be a significant impact.

With Alternative 2, although there would still be a significant impact to serpentine bunchgrass habitat, this impact would be less than under the proposed project.

**Mitigation Measure 6.6-3** The applicant shall implement the following measures to eliminate or reduce impacts on serpentine bunchgrass habitat:

**Mitigation Measure 6.6-3(a)** Avoid direct impacts to serpentine bunchgrass habitat:
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- Redesign the PDP to preserve serpentine bunchgrass habitat within Parcels A and B at a minimum 3:1 preservation:loss ratio.

**Mitigation Measure 6.6-3(b)** Ensure the in perpetuity preservation of native bunchgrass habitat remaining after project development:

- The applicant shall dedicate all preserved serpentine bunchgrass habitat on-site (Parcel A and B) to the MCOSD. Should no agreement be reached with the MCOSD regarding such a dedication, the applicant shall dedicate the parcel to a public agency or non-profit approved by Marin County as determined in consultation with all applicable resource agencies (CDFG and USFWS) for control and management.

- As an alternative to fee title dedication of all or any portion of Parcel A or Parcel B and with the approval of Marin County, the POA may retain ownership of these parcels, or any portion of these parcels and dedicate a conservation easement to a public agency or non-profit approved by Marin County, in consultation with all applicable resource agencies (CDFG and USFWS). Any such parcel(s) shall be subject to the same Resource Management Plan as Parcel A and B (see Mitigation Measure 6.6-1(b)).

**Mitigation Measure 6.6-3(c)** Ensure the in perpetuity preservation and management of serpentine bunchgrass habitat remaining after project development by developing, implementing and funding an RMP as set forth in Mitigation Measure 6.6-1(b).

**Mitigation Measure 6.6-3(d)** Avoid indirect impacts to preserved serpentine bunchgrass habitat:

- Incorporate barriers such as retaining walls along the downslope edges of all designated building and landscape envelopes that occur adjacent to and immediately upslope of serpentine bunchgrass habitat to preclude irrigation and landscape chemicals from making their way downslope onto on-site and off-site preserved serpentine bunchgrass habitats.

**Significance after Mitigation** Implementation of Mitigation Measures 6.6-3(a) through 6.6-3(d) taken together would avoid direct and indirect impacts to, and preserve, the majority of serpentine bunchgrass habitat occurring on-site, and the impact would be reduced to a less-than-significant level.

**Impact 6.6-4  Loss of Coast Live Oak Woodland**

With *Alternative 2*, 9.98 acres of coast live oak woodland (20.9 percent) would occur within lot envelopes designated for home building and landscaping. Additionally, the hiking trail alignment proposed under *Alternative 2*, extending from the southeast corner of the site up to Paradise Drive near the proposed driveway for the Remainder Lot, would result in additional losses of this habitat. The portion of the trail from the southeast corner up to Drainageway 3 (approximately 2,350 linear feet) would follow an existing dirt road alignment and would not be expected to result in new impacts. Beyond Drainageway 3, the proposed trail would leave the existing alignment and would permanently impact another estimated 0.09 acres of woodland habitat. Temporary impacts to this habitat as a result of trail construction are also likely to occur.

With *Alternative 2*, only 24.29 acres (50.9 percent) of woodland habitat would be preserved in Parcel A proposed for dedication to the MCOSD, resulting in a preservation:loss ratio of only 2:1 for woodland habitat, as opposed to 35.60 acres (74.6 percent), or a preservation:loss ratio of 3:1, under
the proposed project. The loss of 9.98 acres of woodland habitat under Alternative 2 in the absence of a minimum 3:1 preservation:loss ratio to compensate for this loss would be a significant impact.

This impact would be greater than under the proposed project.

**Mitigation Measure 6.6-4** The applicant shall implement the following measures to reduce impacts to coast live oak woodlands to a less-than-significant level:

**Mitigation Measure 6.6-4(a)** Redesign Alternative 2 to preserve coast live oak woodland habitat within Parcel A at a minimum 3:1 preservation:loss ratio.

**Mitigation Measure 6.6-4(b)** Ensure the in perpetuity preservation, enhancement and management of oak woodland habitat remaining on-site after project development:

- The applicant shall dedicate all preserved woodland habitat on-site (Parcel A) to the MCOSD. Should no agreement be reached with the MCOSD regarding such a dedication, the applicant shall dedicate Parcel A to a public agency or non-profit approved by Marin County as determined in consultation with all applicable resource agencies for control and management.

- Develop, implement and fund an RMP as set forth in Mitigation Measure 6.6-1(b). The RMP shall be developed to be consistent with Marin County’s Oak Woodland Voluntary Management Guidelines. The RMP shall also contain a Fuel Management Plan element to ensure that vegetation on preserved areas and adjacent private lots with the project site is maintained consistent with all current and future fire safety guidelines. The plan will include provisions for mitigating woodland impacts as a result of fuel management activities through woodland enhancement in unaffected areas of the site.

**Mitigation Measure 6.6-4(c)** Reduce or eliminate indirect impacts to preserved native trees and woodlands on-site or off-site as a result of project construction or long-term use of individual lots:

- Dispose of cut down trees in ways consistent with the most current recommendations of the University of California Oak Mortality Task Force to reduce the likelihood of the spread of SODS to unaffected areas in the region, or to any potentially unaffected areas of the site (although it is likely that all woodland areas on-site and adjacent to the site are already infected). The applicant shall consult with the Oak Mortality Task Force to obtain a list of their recommendations, and these will be written into the CC&Rs.

- During project construction, the applicant or individual lot owners shall be responsible for protecting native trees and other woodland vegetation to be retained by erecting exclusionary fencing around the root zones of trees that will be retained or at the edge of woodland vegetation that will be retained to ensure that retained woodland trees and other vegetation are not removed or indirectly impacted by soil compaction at the root zone by heavy equipment. The applicant shall ensure that these requirements are written into the CC&Rs.

**Significance after Mitigation** Implementation of Mitigation Measure 6.6-4(a) through 6.6-4(c) taken together would reduce project impacts to oak woodlands to a less-than-significant level (although this would not result in less-than-significant impacts as a result of the loss of ordinance-size trees [see Impact 6.6-8 Loss of Ordinance-Size Trees]). These mitigations would result in the in perpetuity preservation, enhancement, and management of oak woodlands on-site at a minimum 3:1 preservation:loss ratio. These measures would also eliminate or reduce to a less-than-significant level any indirect impacts to remaining trees on-site. However, should redesigning Alternative 2 to achieve
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a preservation:loss ratio of 3:1 be determined not feasible, Mitigation Measures 6.6-4(b) and (c) would not be adequate to reduce impacts to coast live oak woodland to a less-than-significant level and would result in a significant unavoidable impact.

Impact 6.6-5  Disturbance to Jurisdictional Waters

Proposed landslide repairs would result in permanent and temporary impacts to areas potentially considered jurisdictional by USACE, RWQCB, and CDFG. This would be a significant impact.

This impact would be the same as for the proposed project.

Mitigation Measure 6.6-5 The following mitigation measures when implemented would result in a less-than-significant impact to wetlands and other jurisdictional waters on the site.

Mitigation Measure 6.6-5(a) Ensure the in perpetuity preservation of wetlands and drainages remaining after project development:

- The applicant shall dedicate all preserved wetland and drainage habitats on-site (Parcel A) to the MCOSD. Should no agreement be reached with the MCOSD regarding such a dedication, the applicant shall dedicate Parcel A to a public agency or non-profit approved by Marin County as determined in consultation with all applicable resource agencies (USACE, RWQCB, and CDFG) for control and management.

- Develop, implement and fund an RMP for preserved wetland and drainage habitats as set forth in Mitigation Measure 6.6-1(b).

Mitigation Measure 6.6-5(b) Compensate for impacts to wetlands and other jurisdictional waters as a result of project development:

- Conduct a formal wetland delineation of the site and have it verified by USACE. The applicant shall further calculate the extent of all permanent and temporary impacts to jurisdictional areas and apply to USACE for a Clean Water Act permit to comply with Section 404 of the Clean Water Act, shall obtain a Section 401 Water Quality Certification (or waiver) from the Regional Water Quality Control Board (RWQCB), and shall enter into a Streambed Alteration Agreement with the California Department of Fish and Game (CDFG) to comply with Section 1601 of the California Fish and Game Code.

- Prepare a Wetland and Riparian Mitigation and Monitoring Plan to be included in the RMP. The Plan shall include, at a minimum, the following requirements:
  - Replacement of lost wetland habitat acreage, including wetland habitat that would be lost as a result of the de-watering of the spring on Lot 7, at a ratio sufficient to retain functions and values. A 2:1 replacement:loss ratio would be expected to offset wetland resource impacts adequately. Sufficient opportunities appear to be available on-site to carry out this replacement and may be combined with mitigations for a loss of CRLF habitat on-site (see Mitigation Measure 6.6-2).
  - Establishment of a minimum 100-foot setback between all drainageways and wetlands from proposed lot building sites and infrastructure development; and the development of a plan to mitigate for all temporary or permanent impacts that encroach within the setback, such as for
landslide repairs. Temporary encroachments shall be mitigated through the development of a restoration plan to re-vegetate disturbed areas; while permanent encroachments shall be mitigated through the enhancement of habitat at a minimum 2:1 ratio.

- The development of quantifiable performance measures and final success criteria and remedial measures to be implemented should be created, restored or enhanced wetland and drainageway habitats fail to meet performance measures and success criteria.

- Once-annual monitoring of created, restored or enhanced wetland and drainageway habitats for a minimum five-year period (longer should they not meet the final success criteria after five years), until they meet the final success criteria.

**Significance after Mitigation** Implementation of Mitigation Measure 6.6-5(a) and (b) would reduce impacts to wetlands and other jurisdictional waters to a less-than-significant level.

**Impact 6.6-6 Introduction of Invasive Exotics**

Non-native plants used throughout the site in landscaping of lots or roads could become established in preserved habitats on- or off-site. The importation of fill materials to the site could result in the accidental introduction of invasive exotics to preserved habitats occurring on- or off-site. This would be a significant impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.6-6(a)** The applicant shall have a qualified botanist or horticulturist develop a list of all exotic plants which are known to readily naturalize in habitats similar to those found on the project site. Black locust, blue gum, various brooms, periwinkle, pampas grass, non-native annual grasses and other species known to be invasive and difficult to eradicate shall be placed on this list and shall be prohibited from use in landscaping by applicant or individual lot owners by way of CC&R restrictions. All applicant or lot owner landscaping plans shall be submitted to the County for approval.

**Mitigation Measure 6.6-6(b)** As set forth in Mitigation Measure 6.6-1(b), the RMP shall include a monitoring and management plan for non-native and / or invasive species, or pathogens, considered detrimental to protected resources (weed abatement, SODS management, CRLF predator control, etc.).

**Significance after Mitigation** Implementation of Mitigation Measure 6.6-6 would reduce this impact to a less-than-significant level.

**Impact 6.6-7 Disturbance to Active Bird Nests**

Construction activities could result in incidental impacts on birds of prey (raptors) and other birds which are protected by State and federal statutes should they be nesting on the site during project implementation. This would be a significant impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.6-7** Construction (roads, buildings, etc.) within 250 feet of trees or scrub habitats (the standard construction buffer) shall require a pre-construction survey for active bird nests if such project disturbance occurs during the breeding season. The applicant shall implement and add
to the project’s CC&Rs, for implementation by the individual lot owners, developers of lot clusters, and, subsequently, the POA, the following measures to reduce impacts to nesting birds:

- Within 30 days of beginning construction during the nesting season (February to August), have a qualified biologist survey construction areas and their immediate vicinity (within 250 feet) for active nests. Surveys shall be conducted according to a protocol developed in consultation with the CDFG.

- Mark any active nests discovered during the pre-construction survey on a map and determine and establish an appropriate construction-free setback or buffer around each active nest by means of fencing or stakes with conspicuous flagging. The appropriate size of the buffer will be determined by the biologist based on the species and topography. No construction activities shall be permitted within the buffer area until all young have fledged and are observed by a qualified biologist to be foraging independently of the parents.

**Significance after Mitigation** Implementation of Mitigation Measure 6.6-7 would reduce potential impacts to nesting raptors to a less-than-significant level.

**Impact 6.6-8 Loss of Ordinance-Size Trees**

With Alternative 2, an estimated 980 trees would be lost as a result of the construction of homes, infrastructure, landslide repair, and compliance with Wildland/Urban Interface measures as compared to 742 trees under the proposed project. Additionally, construction of the portion of the hiking trail from Drainageway 3 to its terminus at Paradise Drive near the driveway for the Remainder Lot would result in the additional removal of trees. No tree survey data has been provided by the applicant for construction of the hiking trails. Many of the trees that would be removed are native trees that would be considered ordinance-size pursuant to the County’s Native Tree Preservation ordinance. These consist of coast live oak with a diameter-at-breast-height (DBH) of at least six inches, California bay with a DBH of at least ten inches, and California buckeye with a DBH of at least ten inches. This would be a significant impact. As discussed for the proposed project, while the applicant has proposed planting replacement trees on-site to compensate for the loss of trees due to project construction, adequate areas to accommodate such replacement plantings are non-existent on the site and in the local region. The loss of ordinance-size trees in the absence of a feasible mitigation proposed by the applicant would be a significant impact.

This impact is greater than for the proposed project.

**Mitigation Measure 6.6-8** The loss of ordinance-size trees shall be mitigated by implementing the following mitigation measures.

- Prior to site preparation, landslide repairs, and the construction of infrastructure, the applicant shall be responsible for submitting a report to the County advising on the number of ordinance-size trees to be removed by these activities. Prior to the development of their individual lots, individual lot owners would also be responsible for submitting a report to the County with the number of ordinance size trees that would be removed on their private lots. The requirement that individual lot owners provide this information shall be written into the CC&Rs by the applicant. Currently, it is unknown how many of the trees that would be lost would be considered ordinance-size; however it would not necessarily be required that additional tree surveys are completed as this information can be easily extracted from data collected by the applicant’s arborist in 2008 to supplement the original tree survey report.
The applicant and individual lot owners shall be allowed to mitigate up to 25 percent of lost ordinance-size trees by incorporating tree plantings into their landscape plans for approval by the County, consistent with provisions contained in the Marin County Code Chapter 22.27 (Native Tree Protection and Preservation). Any replacement plantings shall consist of SODS-resistant tree species native to Marin County. For the remaining 75 percent of ordinance-size trees to be removed, the applicant or individual lot owner shall pay a fee in the amount of $500 for each ordinance-size tree that will be removed into the RMP endowment fund.

These funds shall be ear-marked to manage and enhance preserved woodlands on the site through RMP activities such as the removal of non-native invasive plants, SODS management, replacement of dead or dying trees, etc., as well as to fund the re-establishment of woodland vegetation in areas that will be temporarily impacted as a result of landslide repairs.

The applicant shall be responsible for mitigating the loss of ordinance-size trees as a result of site preparation, landslide repairs and infrastructure development; while the individual lot owners shall be responsible for mitigating the loss of ordinance-size trees as a result of development on their individual lots.

**Significance after Mitigation** Implementation of Mitigation Measure 6.6-8, along with Mitigation Measure 6.6-4 would reduce potential impacts to ordinance-size trees to a less-than-significant level.

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**PUBLIC SERVICES**

**Impact 6.7-1 Fire Service Impact**

The impacts Alternative 2 would have on fire protection services would be similar to the proposed project. With Alternative 2, the development of 32 new houses would not create a need for new fire protection facilities, or the expansion of existing facilities, the construction of which would create environmental impacts of their own. As discussed in Impact 6.1-9 in three locations turnouts would be needed to meet TFPD standards and the construction access road, proposed to be removed after construction, would not comply with TFPD standards for grade.

As stated in Section 5.7 Public Services the project site is located in an area where the MERA communications system, which is utilized by the TFPD as well as other emergency service providers, has limited communication and may be in need of a new antenna. Based on the April 2010 site reconnaissance it is expected that there would be a weak radio signal and inadequate emergency radio coverage at the lower elevations on the project site, Lots 18 through 21 and Lots 22 through 31.

This impact would be the same as for the proposed project.

**Mitigation Measure 6.7-1** The applicant shall implement the following mitigation measures in order to reduce the project’s fire service impacts to a less-than-significant level.

**Mitigation Measure 6.7-1(a)** Same as Mitigation Measure 6.1-9.

**Mitigation Measure 6.7-1(b)** In order to reduce the significant emergency radio coverage impacts at lower elevations on the project site, the applicant shall prepare an emergency radio coverage improvement plan. The improvement plan shall clearly show that adequate emergency radio coverage can be provided for Lots 18 through 21 and Lots 22 through 31. The improvement plan shall be
prepared in cooperation with the MERA. One possible method to provide the necessary radio coverage at the lower elevations on the project site would include the following:

- Locate a new emergency radio facility in the vicinity of the existing MMWD’s Paradise Water Tank. The facility could be located either on the project site or possibly on the water tank site with MMWD permission. The facility design might consist of a new tapered monopole as high as the existing water tank with the two antennae extending above the tank. There would also be one microwave dish, a small radio building (approximately ten-feet by 18-feet) and an emergency generator.

**Significance after Mitigation**

**Mitigation Measure 6.7-1(a)** Same as Mitigation Measure 6.1-9.

**Mitigation Measure 6.7-1(b)** Implementation of Mitigation Measure 6.7-1(b) would provide adequate emergency radio coverage at the lower elevations of the project site and reduce the impact to a less-than-significant level.

**Impact 6.7-2 Wildland-Building Fire Exposure**

Similar to the proposed project, development of Alternative 2 may expose houses and structures to wildland fire risks. With incorporation of the 2003 Urban Wildland Interface Code requirements and TFPD requirements this would be a less-than-significant impact.

**Mitigation Measure 6.7-2** No mitigation would be required

**Impact 6.7-3 Cumulative Fire Service Impact**

Cumulative development in the Tiburon Planning Area could generate additional demand for fire services which may require additional personnel and equipment. This would be a significant cumulative impact.

This impact would be the same as for the proposed project.

**Mitigation Measure 6.7-3** At the time future property owners apply for a building permit they shall pay any fire mitigation fee if such a fee is adopted by the TFPD.

**Significance After Mitigation** Payment of a fire mitigation fee (if adopted by the TFPD) would reduce cumulative impacts to a less-than-significant level. If no such fee has been adopted this would imply that the cumulative impacts of new development within the District had not reached the level to warrant collection of such a fee.

**Impact 6.7-4 Increased Demand for Police Protection Services**

Similar to the proposed project, for Alternative 2 the Marin County Sheriff’s Department would provide police protection to the project site. Alternative 2 would not generate a substantial increase in calls for police services and would not require additional officers or improvements to the Police Department facility. This would be a less-than-significant impact.
Mitigation Measure 6.7-4 No mitigation would be required.

Impact 6.7-5 Cumulative Increased Demand for Police Services

Cumulative development in the unincorporated areas of Marin County could generate additional demand for police services which would require the addition of approximately seven deputies. Marin County is currently planning for development of a new Emergency Operations Facility that would house the Sheriff’s Department. This would be a less-than-significant cumulative impact.

Mitigation Measure 6.7-5 No mitigation would be required.

Impact 6.7-6 Increased Water Demand

Similar to the proposed project, implementation of Alternative 2 would increase water demand on the MMWD. However, the MMWD has sufficient capacity to service the project site. This would be a less-than-significant impact.

Mitigation Measure 6.7-6 No mitigation would be required.

Impact 6.7-7 Water Service Impacts

A specific proposal to provide water service to the Remainder Lot is not included in the description of Alternative 2. A note on the Utility Plan 58 states that a 15-foot wide floating easement would be provided over Parcel A in favor of the Remainder Lot to allow construction of water and wastewater lines. Additionally it is stated that the alignment of the utility lines would be dependent upon the availability of more detailed topography.

One possible way to provide both domestic and fire flow to the Remainder Lot would be to construct both a private water line and a domestic water supply line from the future water line in the construction access road. 59 From the water line in the construction access road both a private fire line (estimated to be six-inch diameter) and an estimated one-inch diameter domestic water supply line would tee off (in the vicinity of the Forest Glen Court cul-de-sac) and travel across Parcel A to the ultimate house location. A fire hydrant would be located on the Remainder Lot. The meter for the domestic line would be at the Forest Glen cul-de-sac.

Alternative 2 includes construction of a new 180,000 gallon water tank and distribution lines within the project site. Due to the elevation of the water tank and the elevation of individual houses some of the houses would not have standard water pressure (40 psi and above). A preliminary water feasibility analysis, as prepared for the proposed project, was not prepared for Alternative 2. However, based on the preliminary water feasibility analysis for the proposed project some conclusions can be drawn for Alternative 2. It is likely that Lots 3 through 8 would have low pressure (30 to 39 psi) or less. As a condition of receiving water service homes with water pressures below 40 psi would be required to

58 Town of Tiburon’s 32 Units LDA, Utility Plan, Easton Point Master Plan / Precise Development Plan / Tentative Map, Sheet C-3, op. cit.

59 Nichols • Berman communication with Michael Tarnoff, LDS inc., April 2010.
sign a low pressure agreement with MMWD. In addition, homes with water pressures of 29 psi or less would be required to install a low pressure pump.

This impact would be similar to the proposed project. However, due to the reduction of the number of houses in the upper elevations of the project site this impact would affect fewer homes than for the proposed project.

**Mitigation Measure 6.7-7** In order to reduce water pressure impacts the applicant shall work with the MMWD to develop a water supply plan. The water supply plan shall clearly show that adequate water pressures would be provided to the new houses on the project site. The plan shall include the following:

- Increase the base elevation of the proposed water tank from 580 feet to 590 feet.
- Replace the existing six inch water main in Paradise Drive with an eight inch water main from the proposed driveway for Lots 21 through 23 to Forest Glen Court. The length of the pipe replacement would be approximately 3,750 feet.
- The applicant and/or property owners shall enter into a low pressure agreement with the MMWD that serves as a written release from liability for any damage or inconvenience associated with the low pressure domestic water service. If necessary the applicant or property owner must install a low pressure pump to provide adequate water pressure for the residence.  

**Significance after Mitigation** Increasing the elevation of the proposed water tank and replacing the water main in Paradise Drive would reduce the number of homes on the project site that would have less than standard water pressure. By entering into an agreement with the MMWD to allow low pressure domestic water service individual property owners would be obligated to install any equipment necessary to provide enough water pressure for domestic use. Taken together, the individual components of Mitigation Measure 6.7-7 would reduce water service impacts to a less-than-significant level.

As discussed for Mitigation Measure 5.7-7 increasing the elevation of the proposed water tank may result in the tank being slightly more visible than as discussed in Section 5.8 Visual Quality discussion of Impact 5.8-4 View from Ayala Cove on Angel Island (Viewpoint No. 4).

**Impact 6.7-8  Inadequate Fire Flow**

Fire flow requirements would be the same for Alternative 2 as for the proposed project, 1,500 gpm at 20 psi for two hours to approved fire hydrants, spaced at 350-foot intervals throughout the subdivision. It also is noted, that for houses over 8,200 square feet steel and concrete, but no wood, construction is required. Of the 32 houses in Alternative 2, 11 are proposed to be larger than 8,200 square feet. The maximum square footage of all structures on Lots 22 through 31 would be 10,000 square feet and on the Remainder Lot would be 15,000 square feet.

As discussed above, a preliminary water feasibility analysis as prepared for the proposed project was not prepared for Alternative 2. However, based on the preliminary water feasibility analysis for the

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60 Marin Municipal Water District Code, Title 11 Water Service Rules and Regulations, May 2009
proposed project some conclusions can be drawn for Alternative 2 regarding fire flow. Based on that analysis the fire flow for Lots 5 through 8 and 18 through 21 would likely be below 1,500 gpm.

As also discussed above, a specific proposal to provide fire flow to the Remainder Lot has not been prepared. One way to provide the required flow may be to construct a private fire line (estimated to be a six-inch diameter line) from the water line in the construction access road to the ultimate house location. A fire hydrant would be located on the Remainder Lot.

Mitigation Measure 6.7-8 In order to mitigate the project’s impacts resulting from inadequate fire flow the applicant shall execute the following through coordination with the TFPD and the MMWD.

Mitigation Measure 6.7-8 (a) Acquire approval of reduced fire flow requirements from the TFPD (as permitted in the 2007 California Fire Code) by implementing structural enhancements to proposed residences including but not limited to:

- Upgrades to building sprinkler systems
- Utilizing non-combustible exterior building materials

Mitigation Measure 6.7-8 (b) Limit the size of proposed houses (total allowable square footage) as needed to meet fire flow requirements.

Mitigation Measure 6.7-8 (c) Upgrade existing water line located in Paradise Drive to an eight-inch line in order to provide adequate water flow and pressure for fire flow requirements.

Significance after Mitigation Implementation of these mitigation measures would reduce Alternative 2’s fire flow impacts to a less-than-significant level through compliance with fire flow requirements by qualifying for reduced fire flow requirements, upgrading existing infrastructure to increase available fire flow, or reducing the proposed building square footage on certain lots to sizes that comply with fire flow calculations.

Impact 6.7-9 Cumulative Water Service Impacts

Cumulative development would result in increased demand on water supplies. However Alternative 2 would make a less than cumulatively considerable contribution to cumulative increases of water demand.

Alternative 2’s contribution to cumulative water service impacts would be similar to the proposed project.

Mitigation Measure 6.7-9 No mitigation would be required.

Impact 6.7-10 Increase to Wastewater Treatment Demand

Similar to the proposed project, implementation of Alternative 2 would increase sewage treatment demands on Sanitary District No. 5. Existing facilities at the Main Treatment Plant would have sufficient capacity to serve the project. The additional flow would not require the construction of additional treatment facilities nor would it exceed wastewater treatment requirements of the Regional Water Quality Control Board or violate water quality standards. This would be a less-than-significant impact.
A specific proposal to provide wastewater service to the Remainder Lot is not included in the description of Alternative 2. A note on the Utility Plan states that a 15-foot wide floating easement would be provided over Parcel A in favor of the Remainder Lot to allow construction of water and wastewater lines. Additionally it is stated that the alignment of the utility lines would be dependent upon the availability of more detailed topography. Based on a preliminary review, it appears that future connection to Sanitary District No.5 and generation of additional wastewater from the Remainder Lot would be a less-than-significant impact. The connection would need to be consistent with Sanitary District No. 5 requirements in order to fully minimize impacts.

**Mitigation Measure 6.7-10** No mitigation would be required.

**Impact 6.7-11 Increased Cumulative Wastewater Treatment Demand**

Cumulative development would increase sewage treatment demands on Sanitary District No. 5. Both wastewater treatment plants (Main treatment plant and Paradise Cove treatment Plant) have sufficient capacity to service the project and planned cumulative development within SD No. 5’s service district and sphere of influence. This would be a less-than-significant impact, and Alternative 2 would make a less than cumulatively considerable contribution to cumulative demands on sewage treatment.

This would be the same as with the proposed project.

**Mitigation Measure 6.7-11** No mitigation would be required.

**Impact 6.7–12 Temporary Increase to Energy Consumption During Construction**

It is not anticipated that construction of Alternative 2 would generate energy demands that would exceed the capacity of service providers and affect the ability to serve the existing population. In fact, it is anticipated that construction contractors would efficiently manage the use of electricity, gasoline, and diesel fuels in order to minimize construction costs. Therefore temporary increases to energy consumption during construction would be a less-than-significant impact.

**Mitigation Measure 6.7-12** No mitigation would be required.

**Impact 6.7–13 Long-Term Energy Impacts**

The average electricity use for residences larger that 2,500 square feet is 10,079 kWh per year. With that in mind, Alternative 2 would produce a demand of approximately 433,397 kWh per year. This is 120,948 kWh per year less than the amount of electricity the proposed project would consume, which PG&E does not anticipate any problems serving the proposed project. As discussed in *Section 5.7 Public Services*, proposed design guidelines, which would apply to Alternative 2, call for energy conserving features. Additionally, Marin County Ordinance No. 3492, which would apply to the project, requires residences over 1,500 square feet to exceed Title 24 requirements by anywhere from 15 percent to 47.5 percent, based on the size of the home (see Exhibit 5.7-2). Based on the

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anticipated energy consumption and energy efficiency requirements that apply to this project, the project would have a less-than-significant impact on long-term energy demand.

**Mitigation Measure 6.7-13** No mitigation would be required

**Impact 6.7–14  Cumulative Energy Impacts**

Completion of Alternative 2, along with the projected buildout of the *Town of Tiburon General Plan* and *Marin Countywide Plan* would increase demand for energy countywide. This increase in demand would not exceed PG&E’s electrical and gas delivery system capacities. This would be a less-than-significant cumulative impact.

**Mitigation Measure 6.7-14** No mitigation would be required.

**Impact 6.7-15  Reed Union School District**

The Reed Union School District (RUSD) estimates that each new single family dwelling unit would result in 0.5 new students enrolled in their district. Therefore Alternative 2 would result in 15 new students to be distributed among K-8. All three district schools have adequate capacity to accommodate project generated students. Because the RUSD has sufficient capacity, Alternative 2 would have a less-than-significant impact on the RUSD.

**Mitigation Measure 6.7-15** No mitigation would be required

**Impact 6.7-16  Tamalpais Union High School District**

Implementation of Alternative 2 would increase enrollment within the Tamalpais Union High School District (TUHSD) by approximately six to twelve students. In conversations with TUHSD, there is concern about increasing student enrollment. However the district has an open enrollment policy that allows each student the flexibility to choose which of the three High Schools in the district they would like to attend. Furthermore, other changes to district policy, such as sharing classrooms during prep hour periods, could increase the district’s flexibility to handle enrollment increases. At this time there are no plans to expand facilities. Implementation of Alternative 2 would not result in a significant impact on the TUHSD.

**Mitigation Measure 6.7-16** No mitigation would be required

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Impact 6.7-17  Cumulative Public School Impacts

Both the Reed Union School District and the Tamalpais Union High School District appear to have operational capacity to accommodate future students due to cumulative development. This would be a less-than-significant cumulative impact.

Mitigation Measure 6.7-17  No mitigation would be required

Impact 6.7-18  Project and Cumulative Increase Demand for Solid Waste Services

With Alternative 2, 31 new residences would be constructed on the project site which, based on California Integrated Waste Management per capita estimates, the 31 new houses would generate 189 pounds per day of solid waste. Similar to the proposed project, both Alternative 2 and cumulative development would have a less-than-significant impact on solid waste disposal.

Mitigation Measure 6.7-18  No mitigation would be required

Impact 6.7-19  Open Space Impacts

PEDESTRIAN ACCESS

As with the proposed project, aspects of Alternative 2 may impact Old St. Hilary’s Open Space Preserve and the Tiburon Uplands Preserve. These impacts include pedestrian access impacts, impacts to special status plant species, visual impacts, and open space management.

As discussed in Section 5.7 Public Services the 117 acre Old St. Hilary’s Open Space Preserve features steep topography that impedes the ability to access the entire site from the interior. There are no interior trails that connect the Vistazo fire road (located at the lower portion of the preserve) with the Heathcliff and Lyford fire roads (located at the upper portion of the preserve), and public access is dependent on multiple access points around the perimeter of the open space preserve. Alternative 2 includes the construction of three hiking trails across the project site (see Exhibit 6.0-2), as follows:

- From the point where Ridge Road enters the project site along the property line, adjacent to the boundary of Lots 3 and 4, and then across the site, generally paralleling the water tank access road, to the Old St. Hilary’s Open Space Reserve. This trail would also provide access to the large rock in Parcel A between Lots 4 and 17.

- From the end of Spanish Trail Road across the public open space to Paradise Drive at a point between Forest Glen Court and the Remainder Lot driveway.

- A third trail would be constructed in the roadbed remaining after removal of the proposed construction access road.

The inclusion of these as part of Alternative 2 would perpetuate the informal public access Tiburon residents have grown accustomed to using and negate significant impacts on adjacent open space related to pedestrian access impact.
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SPECIAL STATUS PLANTS

With Alternative 2 the subdivision design in the northwest portion of the project site has been reconfigured. Parcel B, would be expanded from 0.33 acres under the proposed project to 1.99 acres in Alternative 2 and would no longer be isolated from the adjacent Old St. Hilary’s Open Space. The Alternative 2 reconfiguration would preserve the existing connection between the Marin dwarf flax population located on the property with the Marin dwarf flax population located on the adjacent Old St. Hilary’s Open space. Furthermore, as noted in Impact 6.6-1 Impacts to Special Status Plants, the reconfigured lot layout under Alternative 2 would result in fewer residential lots located upslope of the special status plant species occurring on the Old St. Hilary’s Open Space Preserve than under the proposed project. With this change it is unlikely these special status plants (i.e. Marin dwarf flax, Tiburon jewel-flower, Tiburon Indian paintbrush and Carlotta Hall’s lace fern) would be indirectly impacted by irrigation runoff or the downdrift of harmful landscape materials.

As stated in the discussion of Impact 6.6-1 Impacts to Special Status Plants, there is no provision for a Resource Management Plan to monitor and manage the population of special status plants on the project site which may be impacted over time by human and pet activities and these disturbances may carry over to special status plants located at Old St. Hilary’s Open Space Preserve. Over time this would be a significant impact. However this impact would be less with Alternative 2 than with the proposed project.

VISUAL QUALITY

The project site is highly visible from Old St. Hilary’s Open Space Preserve. As discussed in Impact 6.8-1 View From Tiburon Ridge (Viewpoint No. 1), Alternative 2 would appear visually dominant from the St. Hilary’s Open Space Preserve and it would cause a significant change in the visual quality and character of the area. This would result in a significant visual impact, however compared to the proposed project the impact would be markedly less because fewer houses would be seen and there would be no houses in the immediate foreground.

OPEN SPACE MANAGEMENT

As with the proposed project, two open space parcels (Parcel A and Parcel B) would be offered for dedication to the MCOSD. Dedication of parcels A and B as open space would increase management and maintenance burdens for the MCOSD. Further the dedication may constrain the MCOSD’s ability to manage other open space lands for which it is responsible.

Mitigation Measure 6.7-19(a) Mitigation Measures 6.1-7, 6.6-1 and 6.8-1 would be required to mitigate project impacts to the adjacent Marin County Open Space District’s open space.

Mitigation Measure 6.7-19(b) Develop and implement an Open Space Management Plan for parcels A and B. At a minimum the Open Space Management Plan shall include the following elements:

- A description of the maintenance and management methods for the upkeep of the open space.
- Collusion with the mandatory requirements for sensitive habitats Resource Management Plan required in Mitigation Measure 6.6-1(b).
• Determine a mechanism by which the Open Space Management Plan shall be funded in perpetuity in consultation with Marin County and the MCOSD. Such a mechanism would be the establishment by the applicant of a non-wasting endowment, funded by the applicant and / or through monthly POA fees.

**Significance after Mitigation** As discussed for the respective mitigation measures, Mitigation Measures 6.6-1 would reduce impacts to special status species on Old St. Hilary’s Open Space Preserve to a less-than-significant level. However Mitigation Measure 6.8-1 would not reduce the impact to views from Old St. Hilary’s open space to a less-than-significant level. Alternative 2, therefore, would have a significant unavoidable impact to the adjacent Marin County open space.

Implementation of Mitigation Measure 6.7-19(b) would, however, reduce impacts to the MCOSD for management of the open space lands to a less-than-significant impact.

**Impact 6.7-20 Increased Demand on Existing Parks and Open Space.**

Implementation of Alternative 2 would add approximately 71 residents to the Tiburon community. It is not anticipated that a project of this size would result in significant increases of park usage leading to deterioration of parks that would require expanded facilities or other projects that might result in significant environmental impacts of their own. The same can be said for open space recreation, as it would take a significant increase in usage to create problems with deterioration of the local trail system or depletion of other open space resources.

Alternative 2 would not create a need for new parks or open space areas and therefore would have a less-than-significant impact on existing parks and open space.

This impact would be the same as with the proposed project.

**Mitigation Measure 6.7-20** No mitigation would be required

**Impact 6.7-21 Cumulative Impacts on Existing Parks and Open Space.**

Implementation of Alternative 2 along with other anticipated development along the Tiburon Peninsula would not result in significant cumulative impacts on existing parks and open space. Each project would be required to meet parkland dedication requirements, which would provide funds to augment the costs of park maintenance. Furthermore Alternative 2 would not contribute a substantial number of new residents, as discussed above, and would not make a cumulatively considerable contribution to any cumulative impacts on park and open space.

**Mitigation Measure 6.7-21** No mitigation would be required

**VISUAL QUALITY**

The visual quality analysis of Alternative 2 uses the same four viewpoints as selected for the proposed project, as follows:

Viewpoint No. 1 – View from Tiburon Ridge
Viewpoint No. 2 – View from Heathcliff Drive
Viewpoint No. 3 – View from Paradise Drive
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Viewpoint No. 4 – View from Ayala Cove on Angel Island

Exhibits 5.8-4 (view from Tiburon Ridge), 5.8-6 (view from Heathcliff Drive), 5.8-8 (view from Paradise Drive), and 5.8-10 (view from Ayala Cove on Angle Island) show the views as they presently appear from each viewpoint. As a part of this analysis new photo simulations illustrating Alternative 2 were prepared from two viewpoints: Tiburon Ridge and Heathcliff Drive.

Building Heights

In Alternative 2 building heights would be limited depending on the lot location.

- Lots accessed through Hill Haven neighborhood. For Lots 1 through 8 and 10 through 17 homes shall not exceed a maximum of 30 feet in height, as measured from existing grade. The height of the home on Lot 9 shall not exceed 18 feet from existing grade on the uphill side, but the building may step down the slope if permitted by design review. No building or structure on Lot 9 shall break the plane of the San Francisco Bay water view as seen from the trail above at a to be determined Global Positioning System coordinate. Accessory structures shall not exceed 15 feet in height above grade.

- Lots accessed from Paradise Drive. For Lots 18 through 31, where there is a Residential Building Envelope with a percent of slope that exceeds 30 percent homes shall not exceed 35 feet from existing grade. Accessory structures shall not exceed 15 feet above existing grade.

- For the Remainder Lot the house shall not exceed 30 feet in height, as measured from existing grade.

Impact 6.8-1 View from Tiburon Ridge (Viewpoint No. 1)

Exhibit 6.0-39 presents a photo simulation of the site showing development as proposed in Alternative 2 from Viewpoint No. 1 on Tiburon Ridge in the Old St. Hillary’s Open Space Preserve. Houses on at least seven of the proposed 32 lots appear in the simulated view from Viewpoint No. 1. Some of these houses are only partially visible because they are screened by land forms. The houses are shown at the proposed maximum height of 30 feet.

In addition to the houses in the simulated view, new houses on nearby lots to the left of those shown in the simulation would also be in view from Viewpoint No. 1. These include Lots 9 through 17. The houses on Lots 9, 10, 11, and 12 would be fully exposed to view while those on Lots 13, 14, 15, 16 and 17 would be partially visible and to varying degrees. Lots 9 through 17 do not appear in the simulation because the width of the view depicted in the photo, which is controlled by the focal length of the camera lens (50mm in this case) used to take the baseline photograph, does not cover the entire view that could be experienced by persons at Viewpoint No. 1. To do so would require the use of a wide angle lens which would distort the apparent size and distance of objects in the scene. A 50mm lens was used to ensure the scale and accuracy of the scene.

While the elevation of Viewpoint No. 1 is higher than the building lots and affords a view looking down at the site, the houses on Lots 1 through 8 generally would not be seen against the waters of San Francisco Bay. Instead the profile of houses shown in the photo simulation would be seen against a

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65 The percent of slope shall be calculated before residential grading and shall be measured along a line passing through the center of the Residential Building Envelope and perpendicular to the natural contours.
backdrop of development. The roofline of at least some of the houses on Lots 9 through 17, probably those on Lots 13 through 17, would likely protrude slightly above the existing ridgeline that is seen against the water of San Francisco Bay. However, they would obscure no more than a narrow strip of water seen just above the ridgeline. Note that the house on Lot 9 is proposed to be a maximum height of 18 feet above the existing grade on the uphill side of the structure. The intent is to preserve the view of San Francisco Bay as seen from a specific point south of Lot 9 and within the project site.

The introduction of the new development would alter the visual character of the project site. However, this alteration would be consistent with both the CWP land use designation and zoning designation that designate the project site for residential development. Some of the lots proposed for development would be out of view from Old St. Hilary’s Open Space Preserve or seen from limited areas. Lots 18 through 21 and 27 through 31 likely would not be in view. Houses on Lots 22 through 26 would likely be seen but only from areas within the open space that are near the fence line between the open space and the project site and would likely be partially hidden by tall trees that surround them.

The close proximity to Viewpoint No. 1 of homes on Lots 5 through 8 would make them very conspicuous. This would be true of the water tank as well although the tank is not within the simulated view. In this view, Alternative 2 would meet the visual dominance characteristic definition of dominant as presented in Exhibit 5.8-2. Project elements would attract attention as seen from Viewpoint No. 1 due to their contrast in form, line, and texture with those naturally established in the surrounding setting. The new development would compete for the viewer’s attention. Because Alternative 2 would appear visually dominant from the St. Hilary’s Open Space Preserve it would cause a significant change in the visual quality and character of the area. In Viewpoint No. 1, Alternative 2 would result in a significant visual impact. Compared to the proposed project, however, the impact would be markedly less since fewer houses would be seen and there would be no houses in the immediate foreground.

**Mitigation Measure 6.8-1** The applicant shall incorporate the following measures as a condition of approval: revise the PDP, the project’s CC&Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project:

- Locate buildings on Lot 9 through 17 as far from the spine of Ridgeline D as possible so their rooflines do not extend above the ridgeline seen against San Francisco Bay.

- Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from views from the open space and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that over-planting with trees in a formerly grassland landscape would itself create a significant, man-induced visual change. Additionally, urban-wildland interface restrictions would limit the proximity of plantings to homes and other structures.

As discussed for Mitigation Measure 5.8-1 based on the landslide mitigation policy prepared for the proposed project by Miller Pacific Engineering Group all fill buttresses must be within 100 feet of the proposed building site. In order for the proposed buttresses not to be located within the proposed open space (Parcel A) the amount of flexibility of where to locate the homes along the ridges is very limited. Locating buildings on Lot 9 through 17 as far from the spin of Ridgeline D as possible would

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66 Consistency with CWP goals and policies plus the Marin County Code is discussed in Chapter 4.0 relationship to Public Plans.
require either additional buttress fill slope repairs and/or buried pile walls to stabilize the landslides. Lowering the elevations of the buildings on these lots would be feasible, however, it would result in a substantial increase in the depth and size of the buttresses and buried walls that would be necessary to create safe building sites. The surplus grading materials and resulting larger areas of disturbance could also cause secondary impacts.

**Significance after Mitigation** Even with implementation of Mitigation Measure 6.8-1, project elements would be within view from the open space preserve and project contrasts with existing conditions would be evident. Therefore, implementation of Alternative 2 would result in a significant unavoidable adverse visual impact.
Exhibit 6.0-39
Alternative 2 - Post Development Conditions at Viewpoint No. 1 View from Tiburon Ridge

Source: Vallier Design Associates, 2010
Impact 6.8-2  View from Heathcliff Drive (Viewpoint No. 2)

Exhibit 6.0-40 presents a photo simulation of the site showing development as proposed in Alternative 2 from Viewpoint No. 2 at the east end of Heathcliff Drive. Part or all of approximately six houses appear in the simulated view from Viewpoint No. 2 including the house on Lot 1 which can be seen lower on the hillside and to the right of the group of houses at the center of the view and a very small part of the house on Lot 2. This group includes Lots 5, 6, 7, and 8. The house would be seen just below and in front of the one on Lot 5. The roofline of these houses would break the line now formed by the top of the ridge as seen against Angel Island from this viewpoint. All structures that would be in view form this viewpoint are included in the photo simulation.

The introduction of the new development in this view would alter the visual character of the project site although in a manner consistent with both the CWP land use designation and zoning designation that designate the project site for residential development. Most of the lots (Lots 9 through 32) would be out of view from Viewpoint No. 2.

The distance from Viewpoint No. 2 to the closest part of the proposed development is about 0.4 miles. At this distance the proposed development would meet the visual dominance characteristic definition of co-dominant. Project elements would be prominent within the setting and attract attention equally with other landscape features. Because the development would appear visually co-dominant it would cause a significant change in the visual quality and character of the view from Viewpoint No. 2. The change in character of the view caused by Alternative 2 would diminish the attractiveness of the scene. In Viewpoint No. 2, the project would result in a significant visual impact. However, this impact would be less than that of the proposed project since only about half the number of houses would be seen and none would be seen against the sky.

Mitigation Measure 6.8-2  The applicant shall incorporate the following measure as a condition of approval: revise the PDP, the project’s CC&Rs and Design Guidelines to incorporate the following measure in order to reduce the visual impact of the project:

- Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from views from the open space and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that over-planting with trees in a formerly grassland landscape would itself create a significant, man-induced visual change. Additionally, urban-wildland interface restrictions would limit the proximity of plantings to homes and other structures.

Significance after Mitigation  Even with implementation of Mitigation Measure 6.8-2, project elements would be within view from the open space preserve and project contrasts with existing conditions would be evident. Therefore, implementation of Alternative 2 would result in a significant unavoidable visual impact.
Exhibit 6.0-40
Alternative 2 - Post Development Conditions at Viewpoint No. 2 View from Heathcliff Drive

Source: Vallier Design Associates, 2010
**Impact 6.8-3  View from Paradise Drive (Viewpoint No. 3)**

The visual impact of Alternative 2 from Viewpoint No. 3 would be the same as for the proposed project. While most of the proposed homes on the project site would not be visible from Paradise Drive at least two of the homes would appear on a ridgeline and be seen against the sky.

**Mitigation Measure 6.8-3** The applicant shall incorporate the following measures as a condition of approval: revise the PDP, the project’s CC&Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project:

- Locate the building on Lot 14 as far down the slope as possible and the building on Lot 13 as far to the northeast and down the slope as possible so that they do not appear to be on the top of Ridgeline D and their silhouette is not seen against the sky.

- Limit chimney heights and widths to avoid their silhouette being seen against the sky.

As discussed for Mitigation Measure 5.8-1, locating buildings on Lots 13 and 14 further down the slope would likely require either additional buttress fill slope repairs and/or buried pile walls to stabilize the landslides. Lowering the elevations of the buildings on these lots would be feasible, however, it would result in a substantial increase in the depth and size of the buttresses and buried walls that would be necessary to create safe building sites. The surplus grading materials and resulting larger areas of disturbance could also cause secondary impacts.

**Significance after Mitigation** With implementation of Mitigation Measure 6.8-3, project contrasts with existing conditions would be reduced to visually subordinate. Implementation of Mitigation Measure 6.8-3 would reduce the change in visual quality to a less-than-significant impact.

**Impact 6.8-4  View from Ayala Cove on Angel Island (Viewpoint No. 4)**

From Ayala Cove, houses would be seen on the hillside at the upper portion of the project site but not directly on Ridgeline C. Houses on Lots 9 through 17 would appear on Ridgeline D where it descends from the upper ridge and therefore would be lower on the slope. They would be seen against a backdrop of land and other houses. The proposed water tank would appear in a prominent position at the highest point of land on the Tiburon Peninsula seen from Ayala Cove, same as with the proposed project. The proposed construction access road between the existing MMWD water tank and the proposed water tank would form a prominent line across the grassy hillside punctuated in places by retaining walls. Houses on Lots 19 through 21 and Lots 22 through 31 would be partially visible but would appear low on the hillside and relatively unobtrusive. Lots 22 through 31 would be among tall vegetation.

The introduction of the residential development on the hillside, the construction access road, and the water tank on the hillside in this view would alter the visual character of the project site, although in a manner consistent with both the CWP land use designation and zoning designation that designate the project site for residential development. Houses on some of the lots in Alternative 2, including Lots 1, 2, 6, 7, and 8, would likely be out of view from Viewpoint No. 4. However houses on Lots 9 through 17 would be fully exposed to view and those on Lots 3, 4, 5, 9, and 17 may appear close to the top of the ridge or partially protrude above the ridgeline.

The distance from Viewpoint No. 4 to the closest part of the project site is about one mile. At this distance, development would meet the visual dominance characteristic definition of co-dominant as presented in Exhibit 5.8-2. Project elements would be prominent within the setting, particularly
houses on the hillsides of Ridgeline D, the proposed water tank, and the construction access road. Alternative 2 would attract attention equally with other landscape features. Because Alternative 2 would appear visually *co-dominant* it would cause a significant change in the visual quality and character of the view from Viewpoint No. 4. The change in character of the view caused by Alternative 2 would diminish the attractiveness of the scene. In Viewpoint No. 4, Alternative 2 would result in a significant visual impact. However, this impact would be less than that of the proposed project since fewer houses would be in view and no houses would be seen on Ridgeline C.

**Mitigation Measure 6.8-4** The applicant shall incorporate the following measures as a condition of approval: revise the PDP, the project’s CC&Rs and Design Guidelines to incorporate the following measures in order to reduce the visual impact of the project:

- Limit building height of any houses whose roofline would protrude into the sky so that the line formed by land against the sky as seen from Viewpoint No. 4 is not broken. A secondary impact of lower building heights would be a larger building footprint or a smaller housing unit.

- Locate buildings on Lots 9 through 17 as far from the spine of the Ridgeline D as possible.

- Plant native trees and shrubs in a manner reflecting natural growth patterns on the site in locations that would specifically screen buildings from view and integrate them with the landscape. While this may reduce the impact of building appearance, it should be noted that over-planting with trees in a formerly grassland landscape would itself create a significant, man-induced visual change. Additionally, urban-wildland interface restrictions would limit the proximity of plantings to homes and other structures.

As discussed for Mitigation Measure 5.8-1 locating buildings on Lots 9 through 17 further down the slope would likely require either additional buttress fill slope repairs and / or buried pile walls to stabilize the landslides. Lowering the elevations of the buildings on these lots would be feasible, however, it would result in a substantial increase in the depth and size of the buttresses and buried walls that would be necessary to create safe building sites. The surplus grading materials and resulting larger areas of disturbance could also cause secondary impacts.

**Significance after Mitigation** Even with implementation of Mitigation Measure 6.8-4, project elements would be within view from the open space preserve and project contrasts with existing conditions would be evident. Therefore, implementation of Alternative 2 would result in a significant unavoidable adverse visual impact.

**Impact 6.8-5 Landslide Repair**

Proposed landslide repair on the project site would be accomplished primarily by subsurface methods, but would also employ some above-ground elements. Long-term visual evidence of landslide repair may persist and be recognizable as an unnatural alteration of the hillside. This would be a significant visual quality impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.8-5** The applicant shall incorporate the following measures as a condition of approval: revise the PDP to incorporate the following measures in order to reduce the visual impact of the proposed landslide repair:
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- Re-grade areas where landslides are repaired by removal and replacement methods so that the finished grade mimics the contour of the area immediately adjacent and the surface of the treated area is not unduly uniform or has angular features. Replant or reseed, as appropriate, disturbed areas with species that existed prior to disturbance.

- In areas where subsurface landslide repair is implemented, re-grade disturbed surfaces to match the original grade and replant or reseed, as appropriate, with species that existed prior to disturbance.

- Place debris fences as far back from and as far above Paradise Drive as possible. Retain all vegetation between the road and the debris fence and in the area where the fence is installed so as to provide as much screening of the fence from the road as possible. Specify an appropriate dark color for debris fence material including posts and anchors that will minimize any color contrast with the immediate area where the fence will be installed.

**Significance After Mitigation** Implementation of Mitigation Measure 6.8-5 would reduce adverse visual effects from landslide repair to a less-than-significant impact.

**Impact 6.8-6 Light Pollution**

Implementation of Alternative 2 would result in new lighting sources on the project site which could lead to increased light pollution. This would be a significant impact.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.8-6** The applicant shall prepare a Lighting Plan to incorporate into the Precise Development Plan. The lighting plan shall require:

- All light sources shall be shielded from off-site view;
- All lights shall be downcast;
- Escape of light to the atmosphere shall be minimized;
- Low intensity, indirect light sources shall be encouraged.
- Motion-activated lighting systems shall be encouraged.
- Security lighting of driveways, parking areas, and garages shall use low-level bollards with shielded light unless this poses a safety hazard (as determined by Marin County), in which case the area shall be lit using as few as possible, motion-activated shielded lights.
- Lighting of outdoor use areas and walkways shall be mounted on low-level elevation bollards or posts.
- Floodlighting shall be prohibited.
- Lighting of outdoor recreation areas, such as tennis courts, sports courts, and other similar outdoor recreational activity areas, shall be prohibited.
• Mercury, sodium vapor, and similar intense and bright lights shall not be permitted except where their need is specifically approved and their source of light is restricted.

• Submittals for Site Plan and Architectural Review shall include information on the location, types, intensity, and design of exterior lighting consistent with the Lighting Plan.

**Significance After Mitigation** Implementation of Mitigation Measure 6.8-6 would reduce adverse effects from nighttime lighting to a less-than-significant impact.

**CULTURAL RESOURCES**

**Impact 6.9-1 Potential Subsurface Resources**

*Impact 5.9-1 Potential Subsurface Resources* states that no discernible impacts to archaeological resources or human remains are anticipated. However, the possibility cannot be precluded that prehistoric cultural deposits and features are present below the surface and could be damaged during land alteration activities. This would be a significant impact that would hold true for *Alternative 2* as well as the proposed project.

The impact would be the same as for the proposed project.

**Mitigation Measure 6.9-1** The following mitigation measure would be required to mitigate significant impacts to cultural resources:

• Workers involved in ground disturbing activities shall be trained in the recognition of archaeological resources (e.g., historic and prehistoric artifacts typical of the general area), procedures to report such discoveries, and other appropriate protocols to ensure that construction activities avoid or minimize impacts to potentially significant cultural resources;

• In the event that archaeological artifacts, features or other cultural deposits are encountered during future grading, excavation, or other land alteration efforts, all work in the immediate vicinity of the find must be terminated until the discovery can be evaluated by an archaeologist. These discoveries may include prehistoric and / or historic materials. Depending on the extent and cultural composition of the materials, it may be advisable for subsequent excavations to be monitored by an archaeologist who would be ready to record, recover, and / or protect significant cultural materials from further damage. In the case of prehistoric resources, consultation with interested Native American groups is advised; and

• In the event that human skeletal remains are discovered anywhere on the site, work in the vicinity of the discovery must be discontinued and the Marin County Coroner must be contacted. If skeletal remains are found to be prehistoric Native American (not modern), the Coroner will call the Native American Heritage Commission in Sacramento within 24 hours; they in turn will identify the person(s) believed to be the "Most Likely Descendant" of the deceased Native American. The Most Likely Descendant would be responsible for recommending the disposition and treatment of the remains. The Most Likely Descendant may make recommendations to the landowner or the person responsible for the excavation work regarding the appropriate treatment and disposition of the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.
Significance after Mitigation Implementation of Mitigation Measure 6.9-1 would reduce significant impacts to a less-than-significant level.

Impact 6.9-2 Historic Significance of Spanish Trail

Spanish Trail does not appear to have existed during the Spanish or Mexican periods or to be eligible for inclusion on the California Register, despite its historical interest locally, and does meet CEQA definitions as an historical resource. Alternative 2’s effect on it would be less-than-significant.

Mitigation Measure 6.9-2 No mitigation would be required.

Impact 6.9-3 Historic Significance of Keil Cove

The same as for the proposed project, certain impacts of Alternative 2, including changes to the hydrology of the site and construction activities have the potential to cause a substantial adverse change in the historical significance of the Keil Cove property.

This impact would be the same as for the proposed project.

Mitigation Measure 6.9-3 The following mitigation measures would be required to mitigate significant impacts to the historic significance of Keil Cove.

Mitigation Measure 6.9-3(a) Mitigation Measures 6.5-3(a), (b), and (c), designed to reduce impacts associated with potential erosion and downstream sedimentation that could impact sensitive off-site habitats, including Keil Pond, to a less-than-significant level, would also be required to reduce the physical impacts that downstream sedimentation would have on Keil Pond which is a key component of the Keil Cove property (an historical resource) to a less-than-significant level.

Mitigation Measure 6.9-3(b) Mitigation Measure 6.5-6(a) designed to reduce the project’s impact on Keil Spring and the Keil property spring-based water supply to a less-than-significant level would also be required to reduce impacts on the Keil Cove property (an historical resource) to a less-than-significant level.

Significance After Mitigation Implementation of Mitigation Measures 6.5-3(a), (b), and (c) and 6.5-6(a) would reduce the identified hydrology and water quality impacts to a less-than-significant level. In turn, the significant impacts on the Keil Cove property, identified as a historical resource, would be reduced to a less-than-significant level.

ALTERNATIVE WATER TANK SITE

As previously discussed in the description of Alternative 2, the project sponsor submitted information on the possible relocation of the new water tank to the adjacent Old St. Hilary’s Open Space Preserve (see Exhibit 6.0-6). The alternative site has been assessed for geotechnical feasibility by the applicant’s geotechnical consultant. The alternative water tank site would be approximately 0.65 acres.

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The alternative site would be located approximately 150 feet northwest (upslope) of the water tank site in the proposed project, along the same southeast-northwest trending continuation of Ridgeline C (see Exhibit 4.0-1). The 180,000 gallon water tank would be buried underground into hard sandstone. The tank would be covered fully by roughly six to 12 inches of soil seeded with grass. Safety bollards would be required at the alternative site to prevent maintenance vehicles from driving onto the area above the tank.

A 16-foot wide (12 foot wide travel lane with two foot-shoulders) paved access road would connect the water tank site to the proposed on-site Water Tank Road. The access road would start at the cul-de-sac terminus of Water Tank road located just north of Lot 8 and traverse the principal north-south ridgeline occupied by Water Tank Road. A local saddle along the ridgeline would be crossed by the access road. The southern 200 feet of the access road would be placed on fill, while the upper portion of the road would be cut. Similarly, a wedge at the southern corner of the proposed slope would require up to ten feet of fill to construct a maximum passable slope to service vehicles.

The access road and water line would be constructed within a MMWD easement area within the Old St. Hilary’s Open Space Preserve.

Based upon review of plans submitted for the alternative water tank site it appears relocating the tank would have an impact on geology and soils, hydrology and water quality, biological resources, and visual quality. A discussion of potential environmental impacts associated with the alternative water tank site is provided below.

**GEOLOGY AND SOILS**

As a part of this evaluation Snyder & Wilson Engineering (the EIR geologist) reviewed aerial photographs to evaluate the ridge where the water tank would be constructed (continuation of Ridgeline C). Currently, the ridge is accessed via a rough dirt road from the south, where the road splits from another existing dirt road, which traverses much of the Easton Point project site. Franciscan sandstone bedrock is exposed in outcrops along the ridgeline and adjacent slopes. The applicant’s geotechnical consultants performed an evaluation of the proposed alternative tank site from a geotechnical viewpoint. The conclusion of their evaluation was that the proposed site would be acceptable, being cut into hard sandstone bedrock.

**Geology and Soils Impacts**

The elevation of the alternative site is approximately 615 feet. The primarily cut slope below the alternative tank site would have a gradient of between 2:1 (horizontal:vertical) and 2.5:1. Based on a review of the preliminary grading plan, prepared by the applicant, the south end of the proposed access road would be on artificial fill and the remainder of the road and the tank site would be cut into bedrock. Grades for the access road would vary between five and 18 percent. The proposed road gradient would be gentler, at the base of the slope, as it branches off of Water Tank Road in an area of fill. The access road would then steepen as the road would trend to the north and into the areas of proposed cut. It is estimated that approximately 500 cubic yards of fill would be needed to build the approach road, and the depth of the applied fill would range from ten feet at the southern portion of the access road to zero feet at the north end where the road becomes cut into bedrock. As mentioned above additional fill would be placed between the proposed access road and the downslope segment of

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68 Ibid.
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the construction access road. It is not anticipated that construction of the proposed water tank access road would result in any adverse slope stability conditions.

Geologically, the alternative water tank site would be on a ridge and therefore, completely cut into bedrock. As previously mentioned, the bedrock in the area of the proposed tank site is hard Franciscan sandstone. No colluvial deposits or landslides have been mapped on or adjacent to the alternative tank site. The nearest landslide, Landslide 20 (see Exhibit 5.4-1), is a small, shallow slide located approximately 100 feet southeast of the alternative water tank site. It is proposed to improve that landslide through the use of added subsurface drainage. Since the alternative tank site would be cut completely into well indurated sandstone, Landslide 20 would not have an impact on this structure.

Based on the above, and its location off-site and cut into bedrock, the potential impact of the alternative site on off-site geology and soils would be less-than-significant.

It would be necessary that the access road and proposed tank site be constructed under the observation and testing of the applicant’s geotechnical consultants. This would require the preparation of a design level comprehensive geotechnical report that would be reviewed by the Marin County Department of Public Works as specified in Mitigation Measure 5.4-1 to minimize impacts to the proposed alternative tank site and access road.

**Mitigation Measure** If the alternative water tank site is selected the construction of the water tank and the access road shall be included in the design level comprehensive geotechnical report required in Mitigation Measure 5.4-1.

**Significance After Mitigation** Implementation of Mitigation Measure 5.4-1, with the inclusion of the alternative water tank site would reduce soils and geologic impacts to a less-than-significant level.

**HYDROLOGY AND WATER QUALITY**

A site visit of the alternative water tank site to assess the access road alignment and tank location was conducted by Clearwater Hydrology (the EIR hydrologist) in March 2010.

**Water Quality and Drainage Impacts**

As stated above, to provide sufficient geotechnical support for the road alignment, additional fill would be placed between the new road and the downslope segment of the construction access road. These additional grading activities would not alter site drainage patterns or local watershed boundaries. Furthermore, since the water tank would be covered by a vegetated soil “roof”, and the ground surface along proposed road alignment consists of either exposed sandstone bedrock or a very thin veneer of soil over bedrock, there would be no discernable decrease in groundwater recharge relative to the proposed project. The total length of the water tank access road would be roughly equal under both tank locations. Thus, peak flow rates for runoff on either of the affected site watersheds (i.e. Watersheds C, L, and W) would not calculably increase under the alternative water tank site. The alternative site would, by extension, have no additional impact on off-site drainage facilities, including all downstream culverted road crossings.

Based on the above, and its location off-site and further along the ridgeline from Keil Spring, the potential impact of the alternative site on off-site hydrology and on Keil Spring would be either similar to or less than that of the proposed project. Therefore, access road runoff should be diverted to
roadside bioretention systems similar to that specified in Mitigation Measure 5.5-1(b) to minimize impacts to both groundwater recharge and on-site and off-site water quality.

**Mitigation Measure** In order to reduce impacts to water quality the applicant shall implement Mitigation Measure 5.5-1.

**Significance After Mitigation** Implementation of Mitigation Measure 5.5-1 would reduce water quality and drainage impacts to a less-than-significant level.

**BIOLOGICAL RESOURCES**

**Biological Setting**

Site visits to the alternative water tank site on Old St. Hilary’s Open Space Preserve were conducted by Live Oak Associates (the EIR biologists) on March 23, April 17, June 15, and August 23, 2010 for the purposes of evaluating potential impacts to sensitive biological resources as well as to conduct focused surveys for special status plants having potential to occur on the site. The location of the 0.65-acre alternate water tank site and its proposed access road presently supports non-native grassland habitat (non-serpentine) which is undifferentiated from similar habitat occurring immediately adjacent to and east of the tank site on the Easton Point project site. At the time of the site visits, vegetation on the majority of the site was sparse apparently as a result of erosion and possibly as a result of vehicles being driven on the site. The proposed access road appears to follow an existing dirt road which is also mostly barren of vegetation; therefore, impacts as a result of the construction of a paved access road in this location would result in minimal impacts to vegetation. The site does occur up slope from serpentine bunchgrass habitat that supports several special status plants, including Marin dwarf flax, Tiburon Indian paintbrush, Tiburon jewel-flower, and Carlotta Hall’s lace fern although no populations of these species were observed within 200 feet of the site during the site surveys. While trees and other woody vegetation occur adjacent to and just north of the proposed alternate site, it does not appear that construction of the underground tank would impact these.

**IMPACT ANALYSIS**

**Impacts to Special Status Plants**

The alternate water tank site and location of the proposed access road supports non-native grassland habitat as discussed above. Thirteen special status plants have potential to occur in this habitat type in the project region. These species, along with their blooming times, include showy Indian clover (April-June), robust spineflower (April-September), San Francisco popcorn-flower (March-June), alkali milk-vetch (March-June), bent-flowered fiddleneck (March-June), Diablo helianthella (April-June), fragrant fritillary (February-April), San Francisco Bay spineflower (April-August), Santa Cruz microseris (April-May), San Francisco campion (March-August), San Francisco owl’s-clover (April-June), thin-lobed horkelia (May-July), and Marin County navarretia (May-July). Additionally, known populations of special status serpentine endemics occur down slope from the alternate water tank site and if any populations of these species occur in proximity, they may be temporarily impacted as a result of water tank or access road construction activities.

The four focused surveys for special status plants that were conducted on the alternate tank site confirmed that special status plants are absent from the site and would not be impacted by construction of the water tank or access road. These surveys were spaced throughout the blooming season for all
special status plants having potential to occur on the site or in the immediate vicinity. While over 115 species of plants were identified during the surveys either on the alternate site or immediately adjacent to the site (within 100 feet), none of these is a special status plant. Construction of the water tank and access road in the alternative location would result in no impacts to special status plants.

**Mitigation Measure** No mitigation would be required.

### Disturbance to Active Bird Nests

Trees and shrubs, while absent from the alternate water tank site and access road location itself, do occur in close proximity to the site near its northern boundary. While no bird nests were observed during the March and April site surveys, potentially birds could nest here in the future prior to project implementation and could be disturbed during construction of the tank or access road. Any construction activities which adversely affected nesting or resulted in the mortality of individual birds could violate State and federal law and would be a significant impact.

**Mitigation Measure** In order to reduce impacts to active bird nests the applicant shall implement Mitigation Measure 5.6-7.

**Significance After Mitigation** Implementation of the above mitigation measure would reduce impacts to active bird nests, should they occur near the alternate tank site, to a less-than-significant level.

### VISUAL QUALITY

#### Visual Impact

The most obvious visual impact benefit of the alternative water tank site would be the elimination of the 180,000 gallon above ground water tank. As discussed in Section 5.8 Visual Quality the proposed water tank would be a highly conspicuous feature of the project. For the proposed project, Alternative 2, Alternative 3, and Alternative 4 the water tank would be highly visible from off-site locations such as Tiburon Ridge (viewpoint No. 1) and Ayala Cove on Angel Island (viewpoint No. 4).

For the alternative site, because the water tank would be below ground, the tank itself would not be in view. Visual evidence of the buried tank would include a decrease of about one to three feet in the elevation and profile of the continuation of Ridgeline C at the location where the tank would be buried, safety bollards at the edge of the area directly above the buried tank, grading required to create the access road to the tank site, and the access road itself. Of these features, the access road and its required grading would constitute the most obvious visual evidence. They would be recognizable as man-made features within the otherwise mostly natural setting of the Old St. Hilary’s Open Space Preserve. The access road would be visible from some areas within the Open Space and from any off-site areas from which the point of Tiburon Ridge can be seen. These include the project site itself and more distant locations such as Angel Island and the Town of Belvedere. This would be a significant visual impact.

**Mitigation Measure** The applicant shall incorporate the following measures in order to reduce the visual impact of the alternative water tank site:

- Color the pavement of the water tank access road so that it results in the minimum color contrast with the surrounding setting as possible.
• The final grade of all disturbed areas shall be as close as possible to the original grade. Use slope rounding and contour grading to minimize the man-altered appearance of all areas disturbed during construction.

• Reseed all disturbed areas with grasses that now exist on the site in order that the reseeded areas will become visually indistinct from surrounding undisturbed areas.

• Instead of bollards at the tank site, use special made vehicle barriers that are similar in appearance (texture, shape, color) to native rock outcrops that occur within the open space and near the alternative tank site.

**Significance after Mitigation**  Even with implementation of the above mitigation measure, the access road would remain an obviously man-made feature within the Old St. Hilary’s Open Space Preserve. Therefore, implementation of the alternative water tank would result in a significant unavoidable adverse visual impact.

### 6.3 ALTERNATIVE 3 – VISUAL QUALITY ALTERNATIVE

*Alternative 3* is essentially a reconfigured development alternative with a lot configuration that is intended to reduce the visual impacts that would result from the development of the of the proposed project. *Alternative 3* proposes the same number of residential lots as the proposed project (43), the lots are smaller but comply with the minimum lot size contained in the Judgment. The lots have been relocated to reduce the visual presence / prominence of the project within particular views that would constitute significant impacts to visual quality. These significant visual impacts, which are discussed in **Section 5.8 Visual Quality**, include the views from Tiburon Ridge (*Impact 5.8-1 View from Tiburon Ridge*), from Heathcliff Drive (*Impact 5.8-2 View from Heathcliff Drive*), from Paradise Drive (*Impact 5.8-3 View from Paradise Drive*) and from Angel Island (*Impact 5.8-4 View from Ayala Cove on Angel Island*). The focus of *Alternative 3* is to develop an alternative layout to avoid or substantially lessen the project’s significant impacts to visual quality.

With *Alternative 3* the amount of development that would occur at higher elevations would be considerably less than the proposed project. Twenty-one (21) residential lots would be constructed at higher elevations in the western portion of the project site where the proposed project would have 30 residential lots developed. Each lot would be at least one-half acre. With *Alternative 3* residential lots are proposed in the following areas (see Exhibit 6.0-41):

• Twenty-one (21) lots (Lots 1 through 21) would be accessed via an extension of Ridge Road from the Hill Haven neighborhood. With *Alternative 3* the location and alignment of roads and driveways that are located in the western portion of the project site would be similar to the proposed project, except there would be no extension of Mountain View Drive onto the project site. The configuration of lots would be substantially different than the proposed project in ways that may lessen visual impacts.

  □ The majority of the area where the proposed project would place Lots 1 through 4 and Lot 7 would remain undeveloped. This is the area of the project site upslope from Old St. Hilary’s Open Space Preserve and the Mountain View Drive neighborhood.

  □ Mt. Tiburon Road would be located the same as with the proposed project, however residential development of eight lots along Mt. Tiburon Road (Lots 1 through 8) would be
limited to the western side of the road, which would substantially reduce the amount of development along Ridgeline C (see Exhibit 4.0-1).

- Thirteen (13) lots (Lots 9 through 21) proposed along Ridge Road with reduced lot sizes that would not extend downslope from Ridge Road as far as the proposed project would.

- Six (6) lots instead of three (Lots 22 through 27) on Paradise Drive that would be accessed from Paradise Drive via a shared driveway.

  - With Alternative 3 more development would occur in this area as six lots would be constructed where the proposed project would place three.

  - The proposed length and alignment of the driveway providing access to these lots from Paradise Drive would be the same as with the proposed project.

  - With Alternative 3 six lots averaging 0.54 acres would be located along the western site of the proposed driveway.

- Sixteen (16) lots (Lots 28 through 43) off Paradise Drive near the MMWD water tank. As with the proposed project, a new road (Forest Glen Court) would provide access to this neighborhood. These lots would either front directly on Forest Glen Court or be accessed from a shared driveway that would connect with Forest Glen Court.

  - With Alternative 3 16 residential lots totaling approximately 8.9 acres would be developed where the proposed project would place ten residential lots totaling 11.63 acres. Where the proposed project would have new residences up to and adjacent to the MMWD’s Paradise Water Tank, with Alternative 3 development would not extend as far to the west.
Analysis of Alternative 3

LAND USE AND PLANNING

Alternative 3 would result in a project that would be more consistent with public plans and policies than the proposed project. Alternative 3 would have the same number of residential lots as the proposed project (43), and therefore would be consistent with the general density requirements of the CWP land use designations that overlay the project site (Planned Residential (PR) and Single Family 6 (SR6)). Additionally, Alternative 3’s revised lot configuration would have nine fewer lots located in the Ridge and Upland Greenbelt (RUG) area that overlays 73.38 acres of the project site. Therefore, Alternative 3 would be more consistent with Policy CD 1.3 Reduce Potential Impacts which calls for reduced densities in the RUG.

Like the proposed project inadequate fire flow, as discussed in Section 5.7 Public Services, would still be an issue. However because Alternative 3 would be developed at the project site, which is a location adjacent to existing development that receive public services and utilities, it would maintain consistency with Policies CD 1.1 Direct Land Uses to Appropriate Areas and CD 1.2 Direct Urban Services which call for development compatible to the efficient delivery of public services and utilities.

In terms of policies that are intended to protect and enhance biological resources Alternative 3 would result in less development in the areas of the project site containing habitat for rare plant species, which would substantially reduce impacts to the Marin dwarf flax and serpentine reed grass and therefore would be more consistent with CWP goals and policies that support protection of these plants, such as Goal BIO-2 Protection of Sensitive Biological Resources, Policy BIO-2.2 Limit Development Impacts and Goal OS-1 Sustainable Managed Open Space.

TRANSPORTATION

Alternative 3 would result in the same number of residential lots as the proposed project. Therefore most transportation impacts discussed in Section 5.1 Transportation would be the same with Alternative 3. However, with Alternative 3 Mountain View Drive would not provide access to the project. Under Alternative 3 a total of 21 homes would have access through the Lyford’s Cove / Old Tiburon and Hill Haven Neighborhoods, nine less than with the proposed project. As a result transportation impacts from construction (Impact 5.1-13 Construction Traffic Impacts) and project traffic would be less in the Lyford’s Cove/Old Tiburon and Hill Haven neighborhoods (Impact 5.1-10 Project Traffic Added to Lyford’s Cove / Old Tiburon and Hill Haven Neighborhoods Streets – Accident Records, Emergency Access and Traffic Flow). With Alternative 3 more lots would be developed with access directly from Paradise Drive, which would result in a different distribution of vehicle trips than the proposed project. While this would not affect identified impacts the project would have on study intersections, it would intensify the need to mitigate impacts related to sight distance along Paradise Drive (Impact 5.1-3 Safety Impact Due to Inadequate Distances Approaching the Unsignalized Intersections of Paradise Drive with Project Access Roads).
AIR QUALITY

With Alternative 3 air quality impacts would be the same as with the proposed project and could still be mitigated to less-than-significant levels with proposed mitigation measures. Alternative 3 would have fewer and less expansive lots adjacent to the Hill Haven neighborhood in the northwest corner of the project site. This would reduce impacts on this portion of the Hill Haven neighborhood resulting from dust generating construction activities (Impact 5.2-1 Construction-Period Air Pollutant Emissions). However Alternative 3 would increase the intensity of construction where Lots 22 through 27 (see Exhibit 6.0-41) would be located, and possibly may increase the degree of impact on existing residences near Spanish Trail Road. As discussed under Mitigation Measure 5.2-1 these impacts could be mitigated to less-than-significant levels.

Alternative 3’s emission of greenhouse gases would be similar to the proposed project.

NOISE

As discussed in Section 5.3 Noise, the project site is located in a quiet area, and once developed would be exposed to minimal noise. Similar to the proposed project, Alternative 3 would result in construction related noise impacts. With Alternative 3 noise generating construction activities in the western portion of the project site would be reduced because fewer homes would be constructed in this area. This would reduce noise impacts to existing residences in the Lyford’s Cove / Old Tiburon and Hill Haven neighborhoods. However, as discussed with Impact 5.3-1 Construction Noise, the project site is located in a very quiet area that is sensitive to increases in ambient noise levels. Alternative 3 would still involve the use of dozers, tractors, backhoes, compactors, rollers, dump trucks, and other noise generation equipment during a construction period that could span over multiple seasons. Therefore, similar to the proposed project, even with mitigation measures, noise impacts resulting from Alternative 3 would remain a significant unavoidable impact.

GEOLOGY AND SOILS

Under Alternative 3 development of the project site would still require measures to repair existing landslides on the project site (as discussed with Impact 5.4-1 Landsliding). The requirement contained in Mitigation Measure 5.4-1 to prepare a comprehensive geotechnical report would still be required to prepare a landslide stabilization plan. Other geology impacts, such as Impact 5.4-2 Slope Stability and Impact 5.4-3 Seismicity, would be similar to the proposed project. Depending on the necessary landslide stabilization impacts to groundwater (Impact 5.4-4 Groundwater) may be slightly less than with the proposed project.

HYDROLOGY AND WATER QUALITY

With Alternative 3 the same number of residences would be constructed as with the proposed project. The proposed lot sizes of Alternative 3 would generally be smaller than those contained in the proposed project, however it is assumed that impacts to hydrology and water quality would remain the same. Although the amount of impervious surface may be reduced with Alternative 3, landslide repair would still be necessary and secondary impacts related to landslide stabilization measures (e.g. subdrains) would still occur. Similar to the proposed project, impacts to groundwater and to both on-site and off-site hydrology (Impact 5.5-4 Groundwater Recharge and On-Site Hydrology and Impact 5.5-5 Groundwater Recharge and Off-Site Hydrology) would be less-than-significant. Impacts to Keil Spring and the Keil Property water supply (Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring
and the Keil Property Spring-based Water Supply) would be similar to the proposed project. Mitigation for the Keil property spring-based water supply would be the same as for the proposed project.

**BIOLOGICAL RESOURCES**

*Alternative 3* would involve less construction in the western portion of the project site near the Hill Haven neighborhood and adjacent to Old St. Hilary’s Open Space Preserve. Therefore there would be less direct disturbance to areas where the Marin dwarf flax and serpentine reed grass are known to occur (*Impact 5.6-1 Impact to Special Status Plants*), where the proposed project would eliminate 1.67 acres of habitat mapped for the Marin dwarf flax and 0.08 acres of habitat mapped for the serpentine reed grass. *Alternative 3* would reduce the potential for landscape irrigation runoff and the downdrift of landscape chemicals (herbicides, fertilizers) from the project site to adversely impact rare plant species located on the adjacent Old St. Hilary’s Open Space Preserve. With *Alternative 3* there would also be less disturbance to the scarce serpentine bunchgrass habitat (*Impact 5.6-3 Loss of Serpentine Bunchgrass*). Although *Alternative 3* would decrease the degree of impacts on rare plant species, the smallest impact would be considered significant and unavoidable due to the rarity of these species. Some disturbance to rare plant species would occur, therefore *Alternative 3* would have significant and unavoidable impacts on special status plants. This impact is the same with the proposed project.

*Alternative 3* would involve more intense development in the area where Forest Glen Court is proposed, where 16 residential lots are proposed for this area where the proposed project would develop ten. As a result of this, it would be necessary to remove more trees to provide space for construction and comply with the vegetative fuel reduction aspect of Urban Wildfire Interface regulations. Therefore impacts related to loss of woodland habitat (*Impact 5.6-4 Loss of Coast Live Oak Woodland*), loss of ordinance sized trees (*Impact 5.6-8 Loss of Ordinance-Size Trees*), and disturbance to active raptor nests (*Impact 5.6-7 Disturbance to Active Bird Nests*) would increase from the more intense construction activity. However implementation of proposed mitigation measures would still reduce these impacts to less-than-significant levels.

Within the Forest Glen portion of *Alternative 3* there would be improved opportunity for the California red-legged frog (CRLF) to move over the proposed project. Similar to the proposed projects impacts to CRLF foraging habitat and dispersal movements (*Impact 5.6-2 Impacts to California Red-legged Frog*) would still likely to be significant and mitigation measures would be required.

Like the proposed project, *Alternative 3* would include residential development and the installation of subdrains for landslide repair near seasonal wetlands and drainageways that are likely considered jurisdictional waters by the USACE, RWQCB and CDFG. This would result in significant impacts to jurisdictional waters. As with the proposed project, implementation of proposed mitigation measures would reduce these impacts to less-than-significant levels.

**PUBLIC SERVICES**

With *Alternative 3* impacts to public services would be similar as those resulting from the proposed project. As with the proposed project, the development proposed with *Alternative 3* would fall within the service capacities of public services and utilities. Similar to the proposed project some homes in *Alternative 3* would not have the standard water pressures required for domestic water service (*Impact 5.7-7 Water Service Impacts*). In addition, the water pressure for some homes (likely Lots 1 through
13 and 22 through 27) would not be adequate to provide minimum fire flow requirements (Impact 5.7-8 Inadequate Fire Flow). Mitigation for water service and fire flow impacts would be similar as for the proposed project.

Section 5.7 Public Services includes a discussion of project impacts on adjacent open space (Impact 5.7-19 Open Space Impacts). These include impacts to pedestrian access, special status plants, and visual quality, and these impacts are discussed in other sections of the Draft EIR. Alternative 3 would substantially lessen the significant effects the project would have on views from, and rare plant species located on Old St. Hilary’s Open Space. However Alternative 3, like the proposed project, would result in significant and unavoidable impacts to the visual and biological resources located on Old St. Hilary’s Open Space, and therefore would have a significant unavoidable impact to adjacent Marin County open space.

In addition, with dedication of the open space to the MCOSD Alternative 3 would increase management and maintenance burdens for the MCOSD. Alternative 3 would also require the preparation of an Open Space Management Plan, similar to Mitigation Measure 5.7-19(b).

VISUAL QUALITY

Unlike other impact topics analyzed in this section, the primary criteria for the design of Alternative 3 is to reduce significant visual impacts by redesigning elements of the proposed project to reduce its visibility and prominence within particular viewsheds. The analysis of the how Alternative 3 would reduce visual impacts is described below:

View from Tiburon Ridge (Viewpoint No. 1) - With Alternative 3 fewer homes would be developed in the area visible from Viewpoint No. 1. Development along Mt. Tiburon Road would be limited to the western side of the proposed road, which would substantially lessen the presence of new development within this viewpoint. Implementation of proposed mitigation measures that would limit building height to one story with a maximum height of 18 feet for residences within Viewpoint No. 1, locate buildings as far as possible from the spine of ridgelines, limit chimney heights and widths, and strategically plant native trees and shrubs for screening and to integrate buildings within the viewpoint would minimize the presence of buildings and their rooftlines within Viewpoint No. 1. Therefore Alternative 3 would substantially lessen the significant visual effects of the project. However, because Viewpoint No. 1 has a high level of sensitivity the project would need to be invident in order to avoid causing a significant change in visual quality. Alternative 3 with implementation of mitigation measures would not be invident and, therefore, as with the proposed project, would still result in a significant unavoidable visual impact to the view from Viewpoint No. 1.

View from Heathcliff Drive (Viewpoint No. 2) - As described under Impact 5.8-2 View from Heathcliff Drive the distance from Viewpoint No. 2 to the closest part of the proposed development would be approximately 0.4 miles. Because Alternative 3 would have less development in the western portion of the project site it is likely that 13 residences would be visible, where the proposed project would likely have 20 residences that would be visible from Viewpoint No. 2. This reduction of the number of residences that would be visible from Viewpoint No. 2 would substantially lessen significant visual effects at this viewpoint. However this viewpoint has a maximum level of sensitivity, and the development of Alternative 3 would need to be invident in order to avoid significant impacts resulting from a change in visual quality. Although the visual presence of Alternative 3 would be substantially less, residences within this viewpoint would have a co-dominant visual characteristic, and would not be invident. Therefore Alternative 3, like the proposed project, would result in a significant unavoidable impact resulting from a change in visual quality.
6.0 Alternatives to the Proposed Project

View from Paradise Drive (Viewpoint No. 3) - This viewpoint has a high level of sensitivity. With the proposed project portions of residences located on Lots 15 and 16 would likely be visible from the location of Viewpoint No. 3. This would result in a significant visual quality impact that could be mitigated to less-than-significant levels with proposed mitigation measures. With Alternative 3 development along Ridge Road would be scaled back considerably (see Exhibit 6.0-41). Eight residential lots would be clustered in a pattern that has each lot fronting on the proposed extension of Ridge Road, similar to the proposed project. However with Alternative 3 the extent of these proposed lots would be less expansive than the proposed project, and would not extend as far east along visually prominent Ridgeline D, as the proposed project. Therefore where the proposed project would result with residences on Lots 15 and 16 visible within this viewpoint (see Exhibit 5.8-9), Alternative 3 would have residences located further west and they would not be visually evident from Viewpoint No. 3. If any elements of the proposed residences are visible from this viewpoint it would be slight, and would have a subordinate level of dominance which would result in a less-than-significant impact on the visual quality of views from Viewpoint No. 3.

View from Ayala Cove (Viewpoint No. 4) - From this viewpoint you can witness the scenic quality of the visually prominent ridgelines that create different forms and patterns of land masses within the project site. This viewpoint is a scenic vista that has a maximum level of sensitivity and development of the project site would need to be inevident in order to avoid causing a significant change in visual quality. Alternative 3 would develop nine fewer residences at higher elevation on the western portion of the project site. However these residences, along with the proposed water tank, would be equally disruptive to the scenic quality of visually prominent ridgelines on the project site as the proposed project. Additionally, with Alternative 3 development at lower elevation, which are visible within this viewpoint, would be more dense and likely would require removal of more existing vegetation that provides screening than the proposed project (as seen in Exhibit 5.8-11). Therefore Alternative 3, as with the proposed project, would result in significant and unavoidable impacts to the visual quality of this view.

With Alternative 3 visual quality impacts resulting from landslide repair (Impact 5.8-5 Landslide Repair) and light pollution (Impact 5.8-6 Light Pollution) would still occur. However, as with the proposed project, these impacts would be reduced to a less-than-significant level by implementing proposed mitigation measures.

CULTURAL RESOURCES

With Alternative 3, the potential to disturb subsurface cultural deposits would remain a significant impact (Impact 5.9-1 Potential Subsurface Resources). The significant impact to Keil Cove (Impact 5.9-3 Historic Significance of Keil Cove) would be the same as with the proposed project.

6.4 ALTERNATIVE 4 – BIOLOGICAL RESOURCES ALTERNATIVE

Alternative 4 is a reconfigured development alternative with the same number of lots as the proposed project. This alternative features a reconfiguration of the proposed project’s residential lot pattern, and reduced lots sizes in an attempt to reduce impacts on biological resources that would result from the project as it is currently proposed. These impacts are discussed in detail in Section 5.6 Biological Resources, and includes impacts to the Marin dwarf flax and Serpentine reed grass (Impact 5.6-1 Impacts to Special Status Plants), the California red-legged frog (Impact 5.6-2 Impacts to the California Red-Legged Frog), serpentine bunchgrass (Impact 5.6-3 Loss of Serpentine Bunchgrass), coast live oak woodland (Impact 5.6-4 Loss of Coast Live Oak Woodland), and disturbance to on-site...
wetlands (*Impact 5.6-5 Disturbance to Jurisdictional Waters*). The focus of *Alternative 4* is to develop an alternative layout to avoid or substantially reduce the project’s significant impacts to biological resources. With *Alternative 4* residential lots are proposed in the following areas (see Exhibit 6.0-42):

- Twenty-seven (27) lots contiguous to the Hill Haven neighborhood that, similar to the proposed project, would be accessed via an extension of the existing Ridge Road.

  *Alternative 4* eliminates development of the area where the proposed project would have Lots 1 through 3, 7 and 20. Because of this revision there would be no need to extend Mountain View Road.

  The area where the Ridge Road extension would begin would be less disturbed because of the revised lot configuration and smaller lot sizes. At this area of the project site *Alternative 4* would develop Lots 11 through 13, which are approximately 0.5 acres each and would result in 3.67 acres less lot size in this area where the proposed project would develop Lots 4 through 6 and 20 with an average lot size of 1.3 acres. *Alternative 4* would also reduce development on the east side of Mt. Tiburon Road by eliminating development where the proposed project would have Lots 39 through 42.

  *Alternative 4* would develop 12 lots (Lots 16 through 27) fronting along Ridge Road, west of lots that front on Mt. Tiburon Court. This cluster of lots would develop approximately 6.6 acres for residential lots, where the proposed project would develop approximately 13.4 acres for Lots 10 through 19. With *Alternative 4* development would be less expansive downslope to the north and south of proposed Ridge Road extension, effectively reducing the potential to disturb seasonal wetland, Marin dwarf flax, and coast live oak woodland located downslope from the proposed extension of Ridge Road.

- Five (5) lots in the southeast boundary of the project site where Coast live oak, native and non-native grassland exist where the proposed project would be developed with three larger lots. As with the proposed project, these lots would be accessed from a new driveway that connects with Paradise Drive. The expanse of development along this driveway would be about the same as the proposed project, however with this alternative five lots (Lots 28 through 32) would encompass approximately 2.5 acres fronting on the western side of the proposed driveway where the proposed project would have three larger lots (Lots 21 through 23) encompass approximately 4.9 acres. All five lots would be developed on the western side of Paradise Drive.

- Eleven (11) lots off Paradise Drive near the existing MMWD Paradise Water Tank that would be accessed either directly from Forest Glen Court or from a new shared driveway that would connect with Forest Glen Court. With *Alternative 4* the clustering of these lots would be more compact than the proposed project, leaving an area of undisturbed space between the northwestern extent of these lots (Lots 33 and 43) and the MMWD’s Paradise water tank.

  *Alternative 4* features reduced density in areas where sensitive biological resources are known to occur and would allow the opportunity to increase the area of land to be dedicated as a Marin dwarf flax preserve.
Exhibit 6.0-42
Alternative 4 - Biological Resources Alternative

Source: Marin County, Nichols Berman 2009
Analysis of Revised Site Plan Alternative (Alternative 4)

LAND USE AND PLANNING

Alternative 4 would result in a project that would be more consistent with public plans and policies than the proposed project with regard to preservation of biological resources. Otherwise, like Alternative 3, Alternative 4 would be comparable to the proposed project as it pertains to consistency with public plans and policies. Alternative 4 would maintain the same number of residential lots as the proposed project (43). However it should be noted the design of the proposed project provides a buffer between the proposed houses and existing houses located in the Lyford’s Cove/Old Tiburon and Hill Haven neighborhoods. Therefore whereas the proposed project may result in homes that are larger than existing development in the area, the distance between the development and other neighborhoods may help resolve any obvious differences in scale and character.

In terms of policies that are intended to protect and enhance biological resources Alternative 4 would result in less development in the areas of the project site that support the Marin dwarf flax and serpentine reed grass. Alternative 4 therefore would be more consistent with CWP goals and policies that support protection of these plants, such as Goal BIO-2 Protection of Sensitive Biological Resources, Policy BIO-2.2 Limit Development Impacts, and Goal OS-1 Sustainable Managed Open Space.

TRANSPORTATION

Alternative 4 would result in the same number of residential lots as the proposed project. Therefore most transportation impacts discussed in Section 5.1 Transportation would be the same with Alternative 4. However with Alternative 4 Mountain View Drive would not provide access to the project. Under Alternative 4 a total of 27 homes would have access through the Lyford’s Cove/Old Tiburon and Hill Haven neighborhoods, three less than with the proposed project. As a result transportation impacts from construction (Impact 5.1-13 Construction Traffic Impacts) and project traffic would be slightly less in the Lyford’s Cove/Old Tiburon and Hill Haven neighborhoods (Impact 5.1-10 Project Traffic Added to Lyford’s Cove/Old Tiburon and Hill Haven Neighborhoods Streets – Accident Records, Emergency Access and Traffic Flow). With Alternative 4 more lots would be developed with access directly from Paradise Drive, which would result in a different distribution of vehicle trips than the proposed project. While this would not affect identified impacts the project would have on study intersections, it would intensify the need to mitigate impacts related to sight distance along Paradise Drive (Impact 5.1-3 Safety Impact Due to Inadequate Distances Approaching the Unsignalized Intersections of Paradise Drive with Project Access Roads).

AIR QUALITY

With Alternative 4 impacts to air quality would be the same as with the proposed project. As with the proposed project, implementation of proposed mitigation measures would reduce these impacts to a less-than-significant level.
**NOISE**

*Alternative 4* would result with the same noise related impacts as the proposed project. As with the proposed project, proposed mitigation measures would reduce construction noise during the development of the project site. However, as discussed with *Impact 5.3-1 Construction Noise*, the project site is located in a very quiet area that is sensitive to increases in ambient noise levels. *Alternative 4* would still involve construction activities that generate noise levels that would exceed lower ambient noise levels in the area, and result in a significant unavoidable impact resulting from construction noise.

**GEOLOGY AND SOILS**

Under *Alternative 4* development of the project site would still require measures to repair existing landslides on the project site (as discussed with *Impact 5.4-1 Landsliding*). Mitigation Measure 5.4-1 to prepare comprehensive geotechnical report would still be required to prepare a landslide stabilization plan. Other geology impacts, such as *Impact 5.4-2 Slope Stability* and *Impact 5.4-3 Seismicity*, would be similar to the proposed project. Depending on the necessary landslide stabilization impacts to groundwater (*Impact 5.4-4 Groundwater*) may be slightly less than with the proposed project.

**HYDROLOGY AND WATER QUALITY**

*Alternative 4* would result with the same impacts to hydrology and water quality as the proposed project. *Alternative 4* would feature smaller lots than the proposed project. Therefore it can be assumed that *Alternative 4* would involve less impervious surface than the proposed project. However impacts to water quality (*Impact 5.5-1 Water Quality*), on-site drainage patterns (*Impact 5.5-2 On-Site Drainage Patterns – On-Site and Off-Site Flooding*), erosion and downstream sedimentation (*Impact 5.5-3 Site Drainage Patterns - Erosion and Downstream Sedimentation*) would be the same. Impacts to groundwater and to both on-site and off-site hydrology (*Impact 5.5-4 Groundwater Recharge and On-Site Hydrology* and *Impact 5.5-5 Groundwater Recharge and Off-Site Hydrology*) would be similar to the proposed project. Impacts to Keil Spring and the Keil Property water supply (*Impact 5.5-6 Depleted Groundwater Supplies, Keil Spring and the Keil Property Spring-based Water Supply*) would be similar to the proposed project. Mitigation for the Keil property spring-based water supply would be the same as for the proposed project.

**BIOLOGICAL RESOURCES**

The primary criteria behind the design of *Alternative 4* was to avoid or substantially lessen the project’s impacts to biological resources. The following discussion provides an analysis of how *Alternative 4* would compare to the proposed project with regards to the following impacts:

*Impact 5.6-1 Impacts to Special Status Plants* - The design of *Alternative 4* would significantly reduce disturbance to the western and southern areas of the project site where the Marin dwarf flax and serpentine reed grass are known to occur. With the proposed project development of Lots 1 through 4, 6, 7, and 19 would eliminate 1.67 acres of habitat for the Marin dwarf flax and 0.08 acres of habitat for the serpentine reed grass. With *Alternative 4* development would be substantially reduced in the areas where these plant species occur, and therefore impacts to special status plants from direct disturbance would be substantially lessened. However these special status plants would still be susceptible to
impacts from irrigated runoff and down-drift of fertilization chemicals. Therefore, as with the proposed project, Alternative 4 would result in significant impacts to special status plants.

Implementation of Mitigation Measure 5.6-1 would reduce Alternative 4’s impact on special status plants to a less-than-significant level. As discussed in Section 5.6 Biological Resources, mitigation measure 5.6-1(a) requires the PDP site plan be redesigned to preserve on-site populations of Marin dwarf flax and serpentine red grass. This would likely require relocation or elimination of Lots 1 through 3 as they are located in the originally proposed PDP. This mitigation may be infeasible and thus the proposed project would result in a significant unavoidable impact to special status plants. Alternative 4 is designed to avoid development where the proposed project would have Lots 1 through 3. Therefore with Alternative 4 impact to special status plants could be mitigated to a less-than-significant level while the proposed project may result in significant unavoidable impacts.

Impact 5.6-2 Impacts to the California Red-Legged Frog – One of the significant design elements of Alternative 4 is that it would avoid development in the area where Mitigation Measure 5.6-2(a) encourages a redesign of the proposed project to reduce impacts to the dispersal movement of the California red-legged frog (CRLF). Mitigation Measure 5.6-2(a) requires redesign of the PDP to remove, relocate or reconfigure lots within the Forest Glen area to reduce impacts to dispersal movements of the CRLF to a less-than-significant level. Implementation of this measure would provide a minimum 100-foot wide corridor between preserved woodland habitat in the southern and northern portions of the site. Alternative 4 would leave an approximately 200 feet wide corridor of woodland habitat between the lots on Forest Glen Court and the MMWD parcel undisturbed as suitable foraging and dispersal habitat for the CRLF.

Other impacts could occur to the CRLF from direct harm during construction and/or the degradation of downstream waters that provide breeding habitat. However implementation of Alternative 4 would substantially lessen impacts the project would have on habitat and foraging activities. As with the proposed project, remaining impacts can be reduced to less-than-significant levels with the implementation of proposed mitigation measures.

Impact 5.6-3 Loss of Serpentine Bunchgrass - There is 11.31 acres of serpentine bunchgrass habitat located exclusively in the southwest area of the project site, adjacent to Old Saint Hilary’s Open Space Preserve and the Hill Haven neighborhood. As discussed in Section 5.6 Biological Resources the proposed project would result in the direct loss of 9.44 acres of serpentine bunchgrass habitat. With the elimination of certain lots and reduced lot sizes Alternative 4 would substantially decrease direct impacts to serpentine bunchgrass. Furthermore with Alternative 4 more habitat would be preserved in perpetuity as part of Parcel A dedicated public open space, whereas the proposed project would leave much of the remaining habitat under the control of private use areas.

Serpentine bunchgrass habitat is rare because of the unique physical characteristics of its soil. Any loss of this habitat would be considered a significant impact. The design elements of Alternative 4 essentially implement the measures required in Mitigation Measure 5.6-3 (with exception of Mitigation Measure 5.6-3(d) Avoid indirect impacts). Therefore much of the direct impact would be avoided and more habitat would be permanently preserved within Parcel A. Implementation of Mitigation Measure 5.6-3(d) would further reduce impacts to a less-than-significant level. With the proposed project it may be infeasible to implement Mitigation Measure 5.6-3(a), which could require elimination of proposed Lots 1 through 3 and a reconfiguration of Lots 6 and 19 in order to accomplish a minimum 3:1 preservation/loss ratio for serpentine bunchgrass. In this case the proposed project would result in a significant unavoidable impact on Serpentine Bunchgrass. With Alternative 4 the project design changes required in Mitigation Measure 5.6-3 are implemented and the alternative would result in less-than-significant impacts on serpentine bunchgrass.
Impact 5.6-4 Loss of Coast Live Oak Woodland - Alternative 4 would involve substantially less development in the area of Forest Glen Court, which would translate into the elimination of less woodland habitat. However the loss of woodland habitat would still be a significant impact. As with the proposed project, implementation of Mitigation Measure 5.6-4 would reduce this impact to a less-than-significant level.

Impact 5.6-5 Disturbance to Jurisdictional Waters - The proposed project would disturb jurisdictional waters where construction on Lot 16 would occur within 50-feet of a seasonal wetland that drains into drainageway 1, where the upper portion of drainageway 1 would be encompassed by the private use areas of Lots 17 and 18, and the upper portion of drainageway 2 would occur within the private use areas of Lots 11 and 12. With Alternative 4 no development would occur where the proposed project would have Lot 16 and development would be scaled back for the areas where the proposed project would have Lots 18 and 19. These revisions would reduce impacts to jurisdictional waters, however installation of subdrains for landslide stabilization would still significantly impact jurisdictional waters on the site. Therefore Alternative 4 would still result in significant impacts to jurisdictional waters.

Impact 5.6-6 Introduction of Invasive Exotics - Alternative 4 would still introduce new landscaping to the project site with the potential to introduce invasive exotic species. Like the proposed project, implementation of Mitigation Measure 5.6-6 would reduce these impacts to a less-than-significant level.

Impact 5.6-7 Disturbance to Active Raptor Nests - Although Alternative 4 would not eliminate as much habitat as the proposed project the potential to disturb active raptor nests would still exist. Mitigation Measure 5.6-7 would still be needed to reduce this impact to a less-than-significant level.

Impact 5.6-8 Loss of Ordinance-Size Trees - Although Alternative 4 would result in fewer trees removed from the project site, the loss of ordinance sized trees would still be a significant impact. Implementation of Mitigation Measure 5.6-8 would reduce this impact to a less-than-significant level.

PUBLIC SERVICES

With Alternative 4 impacts to public services would be similar as those resulting from the proposed project. The development proposed with Alternative 4 would still fall within the service capacities of public services and utilities. Similar to the proposed project some homes in Alternative 4 would not have the standard water pressures required for domestic water service (Impact 5.7-7 Water Service Impacts). In addition, the water pressure for some homes (likely Lots 1 through 15 and 28 through 32) would not be adequate to provide minimum fire flow requirements (Impact 5.7-8 Inadequate Fire Flow). Mitigation for water service and fire flow impacts would be similar as for the proposed project.

Similar to the proposed project, Alternative 4 would result in significant impacts to adjacent open space that includes impacts to pedestrian access, special status plants, and visual quality. Alternative 4’s impact to pedestrian access and special status plants located on adjacent open space would be reduced to less-than-significant levels. Impacts to visual quality would remain significant and unavoidable. Therefore like the proposed project, Alternative 4 would have significant and unavoidable impacts to adjacent open space.

In addition, with dedication of the open space to the MCOSD Alternative 4 would increase management and maintenance burdens for the MCOSD. Alternative 4 would also require the preparation of an Open Space Management Plan, similar to Mitigation Measure 5.7-19(b).
6.0 Alternatives to the Proposed Project

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VISUAL QUALITY

With Alternative 4 impacts to visual resources would be similar to the proposed project. Alternative 4 features less development than the proposed project. However, as discussed in Section 5.8 Visual Quality, each of the four viewpoints studied for the project are sensitive to change. Although the appearance of future development would be reduced it would still be evident in areas where the visual quality if sensitive to change, and would result in a significant change of visual character. Thus impacts to visual quality with Alternative 4 would be similar to the proposed project.

CULTURAL RESOURCES

With Alternative 4, the potential to disturb subsurface cultural deposits would remain a significant impact (Impact 5.9-1 Potential Subsurface Resources). The significant impact to Keil Cove (Impact 5.9-3 Historic Significance of Keil Cove) would be the same as with the proposed project.

6.5 ALTERNATIVE SITE ANALYSIS

Among CEQA’s requirements for an EIR to consider and discuss a range of reasonable alternatives to the proposed project is the requirement to address feasible alternative locations to the project site. Any possible alternative site would be subject to the same rule of reason as other alternatives to the project. Therefore, in order to consider and discuss the environmental merits of an alternative site, it should be feasible to develop the project at the alternative site and “attain most of the basic objectives of the project” while “substantially reducing the significant effects of the project”. Furthermore, if a conclusion is reached that there are no feasible alternative locations for the proposed project, the reasons for this conclusion should be disclosed in the EIR.

The stipulated judgment of the United States District Court legally binds the proposed project to the Martha property (project site). Both the 1976 Judgment and the more recent 2007 Judgment state that Marin County is required to approve 43 home sites on the project site unless the parties involved subsequently agree otherwise in writing. Therefore, with respect to the possibility that all parties could agree on a feasible alternative location for the project site it is prudent to further explore feasible off-site alternatives.

A feasible alternative is defined as one where, taking into account economic, legal, social, and technological factors, development could occur in a reasonable period of time. Factors considered in determining the feasibility of any alternative site includes suitability for development, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and an applicant’s ability to acquire the site. While no single factor makes a

69 State CEQA Guidelines, Section 15126.6(a).

70 Ibid.

71 Ibid., Section 15126.6(f)(2)(B).

72 Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, op. cit. and Judgment Pursuant to Stipulation of the United States District Court for the Northern District of California, op. cit.
site infeasible, there are no available vacant sites that would reasonably meet the majority of project objectives. The reasons for this conclusion are discussed below.

Possible alternative sites were assessed to determine whether they could accommodate the proposed Easton Point Residential Development. An alternative site should meet the following criteria, which is based on the project objectives and goals submitted by the project applicant:

- The alternative site(s) should be vacant, privately-owned land. Developed sites or sites already committed to another development which proposes land uses different from those of the proposed project would not be considered potential sites;

- Consistent with the Marin Countywide Plan, the alternative site(s) should be designated for Single-Family Residential land uses at a density range that would allow for this type of development;

- The alternative site(s) should be capable of allowing development according to the proposed project. In the case of this project the Stipulated Judgment requires development of 43 residential lots with a minimum lot size of one-half acre. It is implied in the applicant’s objective that the project should “respect the public interest in land conservation”, (be) “sensitive to unique natural resources”, “appropriately balance the public’s desire to leave large parts of the land open and undeveloped”, and “create the necessary public infrastructure to protect health and safety” Therefore a vacant site exceeding 21.5 acres (43 half acre lots would total 21.5 acres) would be needed to feasibly accommodate the minimal development of this project;

- The alternative site(s) should be in one land holding and free of encumbrances that would prevent or substantially restrict development;

The preferred area for locating an alternative site is the Tiburon Planning Area. The Town of Tiburon General Plan contains an inventory of residential parcels that have similar characteristics to the project site. These parcels are located within the jurisdiction of either the Town of Tiburon or Marin County, and are all located within the Tiburon Peninsula. In order to discern whether or not any feasible off-site location exist within the Tiburon Planning Area a review of each of these parcels was conducted that resulted in the following findings. As a starting point for the analysis, properties should be able to accommodate the minimum development of 43 one-half acre lots with room to spare for open space, possible trails, and other site amenities that reflect the stated objectives of the project applicant. Most of the 21 properties listed in the Town of Tiburon General Plan do not contain the acreage that would be needed to accommodate the proposed development. Listed below are five properties that either have or approach the necessary acreage to accommodate the proposed project, but have been ruled out due to density restrictions contained in the general plan, availability of the property, or physical characteristics that constrain the feasibility of the property to become an alternative site.

Tiburon Glen This property is 26 acres and has a maximum density of 0.3 dwelling units per acre, which would only allow approximately eight units regardless of the size of each lot. 26 acres is probably not large enough to accommodate a development comparable to the proposed project. Even so, the owners of the property are pursuing entitlements for a four lot residential subdivision. Not only is the property not available, environmental review for the Tiburon Glen project has determined that

73 Land Use Element - Tiburon General Plan, Town of Tiburon, adopted September 7, 2005 and revised through March 31, 2006, pages 2-5 thru 2-10.
its development would result in significant unavoidable environmental impacts. Therefore because of its size, unavailable status, and similar development constraints to the proposed project site, this property is not a feasible development alternative.

**Slater** This property is approximately 26.1 acres in size and has a General Plan density of 0.4 dwelling unit per acre, which would allow a maximum of ten units. This property has steep slopes and is bisected by a significant ridgeline. A general plan amendment would be required to allow a denser development on the property. Considering its development constraints (slopes, ridgelines), and its size, it would be speculative to assume a general plan amendment would be approved. Therefore, like the Tiburon Glen property, this property is too small to be considered a feasible development alternative.

**BRC** This property is approximately 50.2 acres, features extremely steep slopes and is heavily wooded. Because of these development constraints the property has a maximum density of 0.1 dwelling unit per acre, which would allow a maximum of five units. A General Plan amendment would be required to allow a higher density development. Since the existing General Plan density reflects physical development constraints on the property (steep slopes and woodlands) it is not likely a General Plan amendment would be approved for the project site. This property is not a feasible off-site alternative to the proposed project site.

**Keil** This property is approximately 30.8 acres and has an allowable density of 0.13 dwelling unit per acre, which would allow four residences. The property is subject to a conservation easement held by the Garden Conservancy. Since the project would only accommodate four residences and is not free of encumbrances to development, it would not make a feasible off-site alternative.

**SODA and Rabin** These two contiguous properties are the project site for the proposed *Alta Robles Residential Development*, which is a proposal to subdivide the properties into 14 residential lots. The property is most likely unavailable to accommodate a different development project. The two properties combine for 50.95 acres General Plan density requirements would only allow 20 housing units. Furthermore the property has similar development constraints (landslide, ridgelines, habitat), so it would be speculative to assume a higher density development would be permitted on this site. Therefore this site would not make a feasible off-site location.

In summary, the *Tiburon General Plan* inventories 21 undeveloped residential parcels that are designated with the Planned Development Residential land use classification. For several of these properties applications for smaller residential developments are under review or have been approved. Regardless of their current development status, these properties are generally too small and contain development constraints which make them infeasible as an off-site development alternative.

### 6.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

On the basis of the discussion of the proposed project and the on-site alternatives, the EIR finds that *Alternative 1* (No Project Alternative) would be the environmentally superior alternative as it would avoid the environmental impacts associated with construction and operation of the proposed project.

The *CEQA Guidelines* (section 15126.6[e]) states that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Of the remaining alternatives, *Alternative 2* (32-Unit Lower Density Alternative) would be the environmentally superior alternative. Although the significant impacts associated with *Alternative 2* would be similar to the proposed project, the reduced number of housing units (32 versus...
43) would result in less disturbance to the project site and thus reduce the degree of several impacts. Some of these impacts, however, would remain significant and in need of mitigation measures.

Exhibit 6.0-43 summarizes the impacts for the 2008 Easton Point Residential Development project and each of the four on-site alternatives. For the proposed project, “LTS” denotes impacts determined to be less-than-significant. “S” denotes significant impacts that would be reduced to less-than-significant with implementation of mitigation measures. “SU” denotes significant unavoidable impacts (i.e., impacts that would not be reduced to less-than-significant with implementation of mitigation measures). Exhibit 6.0-43 summarizes the comparative impacts for each alternative when compared to the proposed project and shows whether the impacts anticipated under each alternative would be lesser, similar, or greater than the proposed project. The exhibit provides a comparison of the ability of each alternative to avoid or substantially reduce the significant impacts of the proposed project.
### Exhibit 6.0-43 Impact Comparison

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### 6.0 Alternatives to the Proposed Project

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**Hydrology and Water Quality**

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### 6.0 Alternatives to the Proposed Project

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<td>5.5-7 On-Site Peak Flow Rates, Existing Storm Drain Capacities and Downstream Flood Protection</td>
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#### Biological Resources

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<td>5.6-1 Impacts to Special Status Plants</td>
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#### Public Services

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## 6.0 Alternatives to the Proposed Project

### 2008 Easton Point Residential Development Draft EIR

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### 6.0 Alternatives to the Proposed Project

#### 2008 Easton Point Residential Development Draft EIR

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*a* LTS = Less-Than-Significant  
S = Significant (impact would be less-than-significant with implementation of mitigation measures)  
SU = Significant Unavoidable (impact would remain significant even with implementation of mitigation measures)

Source: Nichols • Berman
**LAND USE AND PLANNING**

*Alternative 1*, the No Project Alternative would forgo the opportunity to implement the goals and policies in the *Marin Countywide Plan* that are applicable to the project site. Whereas the proposed project, *Alternative 2*, *Alternative 3*, and *Alternative 4* demonstrate consistency with the *Marin Countywide Plan* (CWP), *Marin County Development Code*, *Marin County Single Family Residential Design Guidelines*, *Paradise Drive Visioning Plan* and *LAFCo Policy Guidelines*, the benefits of having a project demonstrate consistency with these policies and guidelines would be lost.

With fewer residential lots *Alternative 2* would be more consistent with certain CWP policies. For example with less homes located along visually prominent ridgelines *Alternative 2* would be more consistent with policies that call for the preservation of ridgelines and other scenic resources. However, other aspects of *Alternative 2*, such as the removal of 238 more trees than the proposed project, would increase the project’s inconsistency with policies intended to protect habitat for special-status species and tree resources.

*Alternative 3* and *Alternative 4* would be more consistent with certain CWP policies than the proposed project. *Alternative 3* would have nine fewer lots located in the Ridge and Upland Greenbelt (RUG). Therefore, *Alternative 3* would be more consistent with *Policy CD 1.3 Reduce Potential Impacts* which calls for reduced densities in the RUG. *Alternative 4* would result in a project that would be more consistent with CWP policies than the proposed project with regard to preservation of biological resources.

**TRANSPORTATION**

Cumulative development would result in a significant unavoidable impact on regional roadways *(Impact 5.1-4)*. The proposed project, *Alternative 2*, *Alternative 3*, and *Alternative 4* would make a small, yet significant contribution to this cumulative impact. Only *Alternative 1* would avoid increasing vehicle trips on regional roadways.

The proposed project, *Alternative 2*, *Alternative 3*, and *Alternative 4* would result in similar transportation impacts, including impacts on bicycle facilities and bicycle safety issues *(Impact 5.1-6)*, impacts on pedestrian circulation *(Impact 5.1-7)*, impacts related to vehicle site emergency access *(Impact 5.1-9)*, the provision of safe on-site roads *(Impact 5.1-11)* and on-site parking space *(Impact 5.1-12)* and construction traffic impacts *(Impact 5.1-13)*. However, due to the reduced number of houses *Alternative 2* would generate a slightly less number of vehicle trips (37 trips in the AM peak hour and 39 trips in the PM peak hour) than the proposed project, *Alternative 3*, and *Alternative 4* (50 trips in the AM peak hour and 49 trips in the PM peak hour). *Alternative 2*, *Alternative 3*, and *Alternative 4* would result in less traffic added to Lyford’s Cove / Old Tiburon and Hill Haven neighborhood streets *(Impact 5.1-10)* than the proposed project. As a result the impact of *Alternative 2* on most transportation impacts would be slightly less than the proposed project, *Alternative 3*, and *Alternative 4*.

With the design of *Alternative 3* and *Alternative 4* more vehicle trips would occur at the proposed unsignalized intersections of Paradise Drive and project access roads, therefore intensifying the need to mitigate the safety impacts due to inadequate sight distances approaching these proposed intersections.
Compared to the proposed project where a total of 30 homes would have access through the Lyford’s Cove / Old Tiburon and Hill Haven neighborhood, the number would be reduced to 17 in Alternative 2. Although still significant, of the four development scenarios, Alternative 2 would have the least impact on the Lyford’s Cove / Old Tiburon and Hill Haven neighborhood.

**AIR QUALITY**

The proposed project, Alternative 2, Alternative 3, and Alternative 4 would result in similar air quality impacts. Alternative 2, Alternative 3, Alternative 4, as with the proposed project, would result in significant construction-period air pollutant emissions (Impact 5.2-1). Because Alternative 2 includes a reduction in grading activities when compared with the proposed project and the other alternatives, construction-period impacts would be slightly less. With Alternative 1 no development would occur and there would be no impacts to air quality.

**NOISE**

The project site is located in a quiet area that is susceptible to significant impacts resulting from increases to ambient noise levels. The proposed project would result in significant unavoidable noise impacts associated with construction noise (Impact 5.3-1). Alternative 2, Alternative 3, and Alternative 4 would also result in significant unavoidable noise impacts. With Alternative 1 no development would occur and therefore no construction noise related impacts would occur.

**GEOLOGY AND SOILS**

The proposed project, Alternative 2, Alternative 3, and Alternative 4 would result in significant impacts associated with landsliding (Impact 5.4-1), slope stability (Impact 5.4-2), seismicity (Impact 5.4-3), artificial fill areas (Impact 5.4-5), and expansive soils (Impact 5.4-6). Implementation of proposed mitigation measures would reduce all of these impacts to a less-than-significant level. In comparison, Alternative 1 would not result in any geological or soils impacts as no development would occur and Alternative 2’s reduced scope of development would reduce the degree of impacts mentioned above. For example, with Alternative 2’s reduction in the number of houses, less landslide stabilization, and reduction of grading and excavating there would be less disturbance to the water source for Keil Spring than with the other development scenarios. Landslide impacts, however, would remain significant and in need to mitigation measures.

**HYDROLOGY AND WATER QUALITY**

With the proposed project, Alternative 2, Alternative 3, and Alternative 4 the effect of subdrain installation to repair landslides would result in significant impacts to on-site drainage patterns (Impact 5.5-2). In regard to groundwater recharge and both on- and off-site hydrology (Impacts 5.5-4 and 5.5-5), due to the reduced extent of the landslide stabilization plan and the number of houses Alternative 2’s impact, would be decreased compared to the proposed project, Alternative 3 and Alternative 4. The proposed project, Alternative 2, Alternative 3, and Alternative 4 would result in significant impacts to water quality (Impact 5.5-1), erosion and downstream sedimentation (Impact 5.5-3) and impacts to Keil Spring and the Keil Property Spring-Based water supply (Impact 5.5-6). Although the impacts of Alternative 2 would remain significant it would represent a substantial improvement over the proposed project, due to the removal of residential lots and related improvements upslope of Keil Spring. These impacts would be reduced to a less-than-significant level with incorporation of
identified mitigation measures. In comparison, Alternative 1 would not result in any impacts, as no changes to the site would occur.

**BIOLOGICAL RESOURCES**

The proposed project, Alternative 2, Alternative 3, and Alternative 4 would result in significant impacts to special status plants (Impact 5.6-1), the California red-legged frog (Impact 5.6-2), serpentine bunchgrass (Impact 5.6-3), coast live oak woodland (Impact 5.6-4), disturbance to jurisdictional waters (Impact 5.6-5), introduction of invasive exotics (Impact 5.6-6), disturbance to active bird nests (Impact 5.6-7), and loss of ordinance-size trees (Impact 5.6-8). With all four development scenarios, the identified significant biological resources impacts would be reduced to a less-than-significant level with implementation of the mitigation measures identified in this EIR. However with the proposed project and Alternative 3 mitigation measures to reduce impacts to special status plants (Impact 5.6-1) and serpentine bunchgrass (Impact 5.6-3) to a less-than-significant level may be infeasible because they involve the elimination or relocation of residential lots, resulting in significant and unavoidable impacts.

Compared to the proposed project Alternative 2 would have less impact to special status plants and the loss of serpentine bunchgrass. Alternative 2 would have greater impacts to both the loss of coast live oak woodland and the loss of ordinance-size trees, primarily due to the construction of the hiking trail from the end of Spanish Trail Road across the public open space to Paradise Drive. Compared to the proposed project Alternative 3 would have less impact to special status plants, to the California red-legged frog and the loss of serpentine bunchgrass. Alternative 3 would involve more intense development in the Forest Glen Court area and thus have greater impacts to the loss of coast live oak woodland, disturbance to active bird nests and the loss of ordinance-size trees. Compared to the proposed project Alternative 4 would have less impact to special status plants, to the California red-legged frog, to the loss of serpentine bunchgrass, to the loss of coast live oak woodland, to the disturbance of jurisdictional water and the loss of ordinance-size trees. Compared to the proposed project, Alternative 1 would not result in any impacts to biological resources, as no development would occur.

**PUBLIC SERVICES**

The proposed project, Alternative 2, Alternative 3, and Alternative 4 would result in significant impacts with respect to fire service (Impact 5.7-1), cumulative fire service (Impact 5.7-3), water service (Impact 5.7-7), and inadequate fire flow impacts (Impact 5.7-8). These impacts would be reduced to less-than-significant levels with incorporation of proposed mitigation measures. The proposed project, Alternative 2, Alternative 3, and Alternative 4 would result in significant unavoidable impacts to the adjacent Old St. Hilary’s Open Space Preserve and Tiburon Upland Preserve (Impact 5.7-19). In comparison, Alternative 1 would not result in any impacts as no development would occur.

**VISUAL QUALITY**

The proposed project, Alternative 2, Alternative 3, and Alternative 4 would result in significant unavoidable impacts to the views from Tiburon Ridge (Impact 5.8-1), Heathcliff Drive (Impact 5.8-2), and from Ayala Cove on Angel Island (Impact 5.8-4). Compared to the proposed project, due to the reduced number of houses, the impact of Alternative 2 on views from Tiburon Ridge, Heathcliff Drive, and Ayala Cove on Angel Island would be less. With the reduced number of houses in the higher
elevations of the project site, compared to the proposed project *Alternative 3* would have less impacts to the views from Tiburon Ridge and Heathcliff Drive but the view from Ayala Cove on Angel Island would be similar.

The proposed project, *Alternative 2*, *Alternative 3*, and *Alternative 4* would result in significant visual impacts due to landslide repair (*Impact 5.8-5*) and light pollution (*Impact 5.8-6*). With all four development scenarios, the identified significant impacts from landslide repair and light pollution would be reduced to a less-than-significant level with implementation of the mitigation measures identified in this EIR. Compared to the proposed project, *Alternative 1* would not result in any visual impacts, as no development would occur.

**CULTURAL RESOURCES**

The proposed project, *Alternative 2*, *Alternative 3*, and *Alternative 4* could result in a significant impact to the historic significance of the adjacent Keil Cove (*Impact 5.9-3 Historic Significance of Keil Cove*). All four development scenarios would result in a similar level of impact. The proposed grading and construction activities associated with the proposed project, *Alternative 2*, *Alternative 3*, and *Alternative 4* could result in significant impacts to subsurface cultural deposits, including human remains, if present. Identified mitigation measures would reduce this impact to a less-than-significant level. *Alternative 1* would not disturb potential cultural resources or impact Keil Cove as no development would occur.
7.0 IMPACT OVERVIEW
7.0 IMPACT OVERVIEW

7.1 GROWTH INDUCING IMPACTS

Section 15126(d) of the State CEQA Guidelines requires EIRs to discuss how a project could foster economic or population growth, or the construction of additional housing (either directly or indirectly) in the surrounding environment.

There are several ways in which growth-inducing impacts can result from new development projects. For example, a project can have a growth-inducing impact if development of that project removes obstacles to future development by creating and making available infrastructure that fosters future development. These physical, infrastructure improvements can include the construction of roads, water lines, sewer service, and other kinds of urban infrastructure and services into previously non-urban areas.

A second type of impact can be the setting of precedents that could allow similar developments to occur in the future. Examples include a development that allows growth in an area previously closed to development such as an agricultural area or outside an urban service area. A precedent setting project can have growth-inducing impacts by increasing the expectations of adjoining property owners who expect the "highest and best use" of their lands.

The 110 acre project site is located in unincorporated Marin County, within the Tiburon Planning Area. Although the property is designated by the Tiburon General Plan as a future annexation area (Paradise Drive Annexation Area), the development application does not include annexation into the Town of Tiburon. Therefore the project site would remain within Marin County jurisdiction, just north-east of the Town boundary. The Marin Countywide Plan (CWP) designates the project site for residential uses, with two different land use designations applied to the property. Furthermore, approximately 70 acres of the project site is also located in the County’s Ridge and Upland Greenbelt Area. Based on the CWP’s allowable density range and taking into account the limitation associated with the Ridge and Upland Greenbelt area, the combined allowable density range for the project site is 28 to 73 housing units. The number of proposed residential lots (43) would be less than the maximum potential density provided for the project site by the CWP. Therefore project implementation would generally conform to existing plans for land use and development that apply to the project site, and would not be considered “premature” development occurring before anticipated, and would not set a precedent by constructing residential development otherwise planned for another use. While implementation of the proposed project would eliminate the potential preservation of the site for open space use, that would not constitute a growth inducing effect of the project.

1 The Tiburon Planning Area consists of the incorporated Town of Tiburon, the unincorporated part of Paradise Drive, the unincorporated area between the western border of incorporated Tiburon and U.S. 101 north of Tiburon Boulevard, and all unincorporated portions of the Ring Mountain Open Space Preserve.

2 Town of Tiburon General Plan, Town of Tiburon, adopted September 7, 2005, Figure 2.5-1 Annexation Areas.

3 As discussed in the Section 3.0 Description of the Proposed Project, approximately 4.5 acres is designated Single Family 6 (four to seven dwelling units per acre), and 105.5 acres is designated Planned Residential (10 to 105 dwelling units per acre).
Key infrastructure components of the proposed project include new roads, a 180,000 gallon water supply tank, and new water and sewer lines that would connect with existing infrastructure. As previously mentioned in this section, if a new development constructs infrastructure that could be utilized by neighboring properties, essentially removing “obstacles” to the development of neighboring properties, the project would have a growth inducing impact.

There are no vacant and developable lands located adjacent to the proposed 2008 Easton Point Residential Development site. Proposed roads would provide internal circulation through the project site and connect with Ridge Road in the Hill Haven neighborhood and Paradise Drive. However, the proposed road circulation is fragmented, meaning it does not provide for travel through the entire project site. Therefore, in the event future growth in the area creates unacceptable delays on primary roadways in the area (Paradise Drive and Tiburon Boulevard), the proposed project’s roads would not be usable for drivers looking for alternative routes, and would not alleviate unacceptable Levels of Service at key intersections.

The proposed on-site water and sewer service lines are designed to provide capacity for the project only, and would not be able to accommodate demands from other new developments. Off-site a four-inch sanitary sewer force main would be constructed in Paradise Drive from Forest Glen Court to approximately 800 feet south of the southern project boundary. Furthermore, it would be necessary to upsize the existing six-inch water line located within the portion of Paradise Drive right-of-way that runs adjacent to the project site to an eight-inch line. As discussed in Section 5.7 Public Services, the proposed water supply tank is needed to provide water service with adequate water pressure for both residences and fire flow requirements. If constructed the new water tank would be operated by the Marin Municipal Water District, which may utilize the water tank to improve water service at existing adjacent neighborhoods. However, because there are no adjacent vacant lands that could utilize the water tank, the project’s infrastructure would not remove obstacles to future development. The CWP (as well as the Tiburon General Plan) designates additional vacant properties in the area for residential development. The off-site sanitary sewer and water line improvements in Paradise Drive could provide improved water and wastewater flows to other properties along Paradise Drive. These infrastructure improvements could have some growth inducing potential although such growth generally would conform to the planned pattern and sequence of growth in the area. Such growth would not represent “premature” development occurring before anticipated by the CWP or the Tiburon General Plan.

For the reasons stated above, the proposed 2008 Easton Point Residential Development is not expected to induce growth on adjacent land and, therefore, would not result in a significant growth inducing impact.

7.2 CUMULATIVE IMPACTS

This section of the Draft EIR assesses the cumulative impacts of implementing the 2008 Easton Point Residential Development project under existing environmental conditions, and also under future conditions with the additional effects of anticipated development in the area. A cumulative impact is an impact that is created as a result of the combined effects of the proposed project evaluated in this EIR together with those of other development projects causing related effects. This section discusses cumulative impacts for each environmental resource topic below. Section 15064(i) of the State CEQA Guidelines states that the significance determination for cumulative impacts be analyzed in two steps:

---

4 CEQA Workshop Series, Association of Environmental Professionals.
1) determine if the whole cumulative impact is significant and 2) determine if the project’s incremental contribution is “cumulatively considerable”. Recent Court guidance ⁵ has been interpreted to imply that the relevant question is not how the effect of the project compares to preexisting cumulative effect, but whether any additional amount is significant in context of the existing cumulative effect. ⁶

When evaluating cumulative impacts, CEQA envisions the use of either a list of past, present, and probable future projects, including projects outside the control of the lead agency, or a summary of projections in an adopted planning document, or some reasonable combination of the two approaches. As discussed in Section 3.3 Cumulative Development Assumption, the geographic area considered for cumulative impacts is the Tiburon Planning Area plus the Strawberry Peninsula and the City of Belvedere. This cumulative analysis uses the development assumptions for the geographic area listed in Exhibit 3.0-13.

LAND USE AND POPULATION

The proposed project would remain under the jurisdiction of Marin County and would be subject to the policies of the CWP, which contain many requirements for new development to have adequate infrastructure and be within the service capacities of local utilities and emergency services. However, as previously mentioned the project site is located within the Planning Area of the Tiburon General Plan which discusses the impacts of growth and concentration of population. ⁷ According to the Tiburon General Plan 2020 EIR build out of the Tiburon Planning Area would result in a population of 11,195, which would account for four percent of the County of Marin population and less than one percent of the projected population of the entire bay area in 2020. Therefore population growth would be consistent with the County and Bay Area and would not be substantial when compared to cumulative growth in the region. Under CEQA, growth is not considered necessarily detrimental or beneficial. ⁸ However growth can result in secondary cumulative impacts on utilities and infrastructure. Since the proposed project includes the construction of infrastructure and would be adequately served by public services, the project would not make a cumulatively considerable contribution to the significant cumulative impacts of substantial growth in Marin County.

TRANSPORTATION

Cumulative traffic conditions were evaluated in Section 5.1 Transportation by using the Town of Tiburon’s PM peak hour traffic model to forecasts the growth in traffic that would be generated by buildout of the Tiburon General Plan. As noted in the traffic analysis, AM peak hour volumes where derived by determining the percent increase in PM peak hour traffic at each intersection, and applying the same rate of growth to AM peak hour traffic. Using this method the EIR’s traffic analyst

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⁶ 2003 Spring CEQA Workshop Series, Association of Environmental Professionals.


⁸ Marin Countywide Plan Update Draft EIR, Nichols • Berman and Marin County, January 2007.
determined that under cumulative conditions, after accounting for planned improvements, 9 three study intersections would operate at unacceptable levels of service (LOS) with or without the project. These intersections are:

- The signalized intersection at Avenida Miraflores / Tiburon Boulevard, which would operate at an unacceptable LOS E during the weekday AM peak hour.
- The signalized intersection at Rock Hill Drive / Tiburon Boulevard, which would operate at an unacceptable LOS E during the weekday PM peak hour.
- The unsignalized Reed Ranch Road southbound left turn onto Tiburon Boulevard, which would operate unacceptably during the AM and PM peak hours.

No improvements are currently planned for these three intersections. As shown in Exhibits 5.1-36 and 5.1-37 traffic from the proposed project would increase delays at the Avenida Miraflores / Tiburon Boulevard intersection by 5.4 seconds during AM peak hours, and the Rock Hill Drive / Tiburon Boulevard intersection by 4.3 seconds during the PM peak hours. These two intersections would already operate at an unacceptable LOS under cumulative conditions without the proposed project. Because the proposed project would increase delays at these impacted intersections, the project contribution to delays would be cumulatively considerable.

At the Reed Ranch Road / Tiburon Boulevard intersection, where southbound left turns from Reed Ranch Road would continue to operate at an unacceptable LOS F, the flow of traffic on Tiburon Boulevard would remain at an acceptable LOS C with the addition of project traffic. This would be a less-than-significant cumulative impact.

The Tiburon General Plan 2020 EIR previously identified a significant unavoidable impact to U.S. 101 resulting from regional development, including development within Tiburon (including development of the project site). 10 The addition of trips generated by development on the project site would represent a relatively small proportion of overall growth on the U.S. 101 corridor. Project trips would constitute approximately 0.01 percent of overall traffic (U.S. 101 carries approximately 15,000 vehicles during the PM peak hour). Although the proposed project would add very little traffic to the U.S. 101 corridor it would add an increment of cumulative traffic which was previously identified as a significant unavoidable cumulative impact.

Impact 5.1-6 Project Impact on Bicycle Facilities and Bicycle Safety Issues discusses cumulative impacts on bicycle facilities and / or safety. As discussed in Impact 5.1-6 the increased vehicular traffic from development along Paradise Drive would result in a cumulatively significant impact to bicyclists. The proposed project would make a cumulatively considerable contribution to this cumulative impact.

Mitigation Measure Mitigation Measure 5.1-2 would be required for the mitigation of cumulative impacts to study intersections. Mitigation Measure 5.1-2 would require that the applicant pay the project’s prorated share of planned lane improvements at the Redwood Highway Frontage

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9 Based on the Tiburon General Plan the planned improvements include Redwood Highway Frontage Road / Tiburon Boulevard (planned lane improvements); Trestle Glen / Tiburon Boulevard (planned lane improvements); and Mar West Street (West) / Tiburon Boulevard (planned signal control).

Road / Tiburon Boulevard intersection, and at the Trestle Glen Boulevard / Tiburon Boulevard intersection, consistent with traffic mitigation fees to be determined by the Town of Tiburon. Additionally, the applicant would be required to pay the project’s prorated share of the cost for the planned signalization of the Mar West / Tiburon Boulevard intersection, consistent with traffic mitigation fees to be determined by the Town of Tiburon. Resulting LOS is shown in Exhibits 5.1-36 and 5.1-37 for these three intersections.

The applicant would pay the proposed project’s fair share of overlapping phasing for the southbound left turn from both Avenida Miraflores and Rock Hill Drive to Tiburon Boulevard. Mitigated intersection LOS for these two intersections is shown in Exhibits 5.1-39 and 5.1-40.

Mitigation Measure 5.1-4 would be required for the cumulative impact to U.S. 101. Mitigation Measure 5.1-6, which includes physical improvements to Paradise Drive to enhance safety for bicyclist, would be required for the cumulative impact to bicycle facilities and safety issues.

**Significance After Mitigation** Implementation of Mitigation Measure 5.1-2 would reduce cumulative impacts at the study intersections to less-than-significant. Mitigation Measure 5.1-6 would reduce the significant cumulative impacts to bicycle facilities to less-than-significant. Even with the implementation of Mitigation Measure 5.1-4 the impact to U.S. 101 would be a significant unavoidable cumulative impact.

**AIR QUALITY**

**Cumulative Air Pollution**

The current *BAAQMD CEQA Guidelines* provide that individual projects may be assessed for cumulative impacts based on an evaluation of consistency of the project with the local general plan and the consistency of the local general plan with the regional air plan. The proposed project is consistent with the land use designation of the *CWP*. However implementation of the *CWP* would result in an inconsistency with the Bay Area Clean Air Plan because the projected rate of vehicle miles traveled (VMT) would exceed the rate of population growth in Marin County. 11 This is a significant cumulative impact and the *2008 Easton Point Residential Development* would make a small incremental contribution due to its part in the implementation of the *CWP*. The *CWP* contains numerous policies and programs that would help reduce motor vehicle use and improve air quality. However it is unlikely that *CWP* programs would reduce the increase rate of VMT to a level lower than population growth. Therefore this issue would remain an inconsistency with the Bay Area Clean Air Plan, resulting in a significant and unavoidable cumulative impact. However the projects contribution to this impact would be less than cumulatively considerable.

**Greenhouse Gas Emissions**

As stated in *Section 5.2 Air Quality* in June 2010 the BAAQMD adopted development guidelines that establish air quality thresholds for greenhouse gases. The project proposes new large residences that would be an additional source of GHG emissions, primarily through consumption of energy for transportation and energy usage. The additional GHG emissions, however, would not exceed BAAQMD GHG significance thresholds. Therefore, the project would make a less than cumulatively considerable.

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11 *Marin Countywide Plan Update Draft EIR*, op. cit., pages 4.3-12 thru 4.3-15.
considerable contribution to significant climate change impacts resulting from the cumulative emission of GHG’s.

**Mitigation Measure** The Marin CWP Update EIR identifies mitigation measures to reduce the effect of cumulative air quality and greenhouse gas emission impacts. Air quality mitigation measure 4.3-1 in the Marin CWP Update EIR requires measures to reduce projected countywide increase in vehicle miles travelled per person. Air quality mitigation measure 4.3-6 in the Marin CWP Update EIR required revisions to CWP program AIR-4.f to approve and begin implementation of the Marin County Greenhouse Gas Reduction Plan.

**Significance After Mitigation** Even with the implementation of mitigation measures identified in the Marin CWP Update EIR cumulative impacts to air quality and greenhouse gas emissions would be significant unavoidable cumulative impacts.

**NOISE**

The project site is located in a quiet area with very low ambient noise levels. Because of the quiet setting in the Tiburon Planning Area, construction noise would be significantly higher than existing ambient noise levels. The possibility exists that other construction projects in the area (such as the proposed Swahn residential project, the Sorokko Master Plan located at 3820 Paradise Drive, or the Alta Robles Residential project located at 3825 Paradise Drive) would occur concurrently with the proposed project, resulting in a significant cumulative impact. Implementation of the proposed project would result in noise generating construction activities that would result in significant unavoidable impacts (Impact 5.3-1 Construction Noise). Because of the project’s close proximity to other potential construction sites (sources of cumulative construction noise), and the project would result in significant unavoidable impacts from construction noise, the project would make a cumulatively considerable contribution to significant cumulative noise impacts.

**Mitigation Measure** Mitigation Measure 5.3-1 would be required to mitigate construction noise impacts.

**Significance After Mitigation** Even with the implementation of Mitigation Measure 5.3-1 construction noise would be a significant unavoidable cumulative impact.

**GEOLOGY AND SOILS**

The Tiburon Planning Area consists of undeveloped hillside properties where development could result in significant impacts associated with seismic ground shaking, seismic-related ground failure, landsliding, slope stability, and soil erosion. Conventional mitigation can reduce these impacts to less-than-significant levels for each individual project. However, mitigation for landslide repair and slope stabilization can result in significant secondary (indirect) impacts to other resources, such as water quality and biotic resources that could be cumulatively considerable. These secondary impacts are addressed in the appropriate resource analysis section. The geologic impacts of other projects in the Tiburon Planning Area would also be reduced with similar mitigation measures and adherence to State requirements such as the Uniform Building Code. Therefore, cumulative geology and soils impacts would be less-than-significant.
HYDROLOGY AND WATER QUALITY

There are three principle watersheds located within the Town of Tiburon Planning Area. These include the North Tiburon Watershed, the South Tiburon Watershed, and the West Tiburon Watershed. Most of the project site is located in the North Tiburon Watershed and drains towards Keil Cove and San Francisco Bay. A small area in the southwest corner of the project site is located within the South Tiburon Watershed and drains into the Railroad Marsh.

The Tiburon General Plan 2020 EIR identifies cumulative hydrology and water resource impacts that could occur with development within the planning area. These cumulative impacts include:

- Cumulative water quality impacts from additional contaminants through natural and artificial drainageways and into North San Francisco and Richardson Bays.
- Cumulative ground water impacts from the incremental increase in impervious surface coverage and the conversion of groundwater to surface water via slope dewatering.
- Cumulative on-site and downstream erosion and sedimentation that would increase both local and downstream flooding.
- Cumulative impacts to stormwater drainage system capacities and expansions.
- Increase exposure of people and structures to flooding hazards, seiche, tsunami, and mudflow impacts.

As proposed the project includes water quality preservation measures in a Stormwater Control Plan 12 which, along with proposed mitigation measures, would reduce the project’s contribution to cumulative hydrologic impacts, including cumulative water quality impacts, cumulative downstream erosion and sedimentation, cumulative impacts to stormwater drainage system capacities, and cumulative flooding hazards to a less than cumulatively considerable level.

As discussed in the Tiburon General Plan 2020 EIR with the implementation of the identified mitigation measures cumulative hydrology and water quality impacts would be reduced to less-than-significant levels.

BIOLOGICAL RESOURCES

Development in the Tiburon Planning Area could result in significant cumulative impacts to special status species, sensitive natural communities, and wetlands. The overall cumulative effect of development would be dependent on the degree to which significant biological resources are protected or mitigated for as part of the individual development projects in the planning area. 13 In other words, a loss of wetland habitat can be adequately mitigated by a restoration of wetland habitat in another location of equal or greater resource value. However development of the Tiburon Planning Area

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13 Marin Countywide Plan Update Draft EIR, op. cit.
would result in a cumulative loss of undeveloped habitat and fragmentation of natural areas that would be a significant cumulative impact. 14

As discussed in Section 5.6 Biological Resources, the implementation of the proposed project would impact or destroy 45.42 acres of natural habitat (see Exhibit 5.6-5). This includes habitat loss related to significant impacts to special status plants (Impact 5.6-1 Impacts to Special Status Plants), and the loss of Serpentine Bunchgrass (Impact 5.6-3 Loss of Serpentine Bunchgrass). Therefore the proposed project would make a cumulatively considerable contribution to the cumulative loss of undeveloped habitat and fragmentation of natural areas.

**Mitigation Measure** Mitigation Measures similar to the recommended mitigation measures in Section 5.6 Biological Resources would be required for future development projects in the Tiburon Planning Area to mitigate cumulative biological resources impacts.

**Significance After Mitigation** Even with the implementation of mitigation measure, the Tiburon Planning Area would sustain cumulative loss of undeveloped habitat and fragmentation of natural areas.

**PUBLIC SERVICES**

**Fire Protection and Emergency Services**

As discussed under Impact 5.7-3 Cumulative Fire Service Impact, the development of the project site together with cumulative development in the Tiburon Planning Area could generate additional demand for fire services from the Tiburon Fire Protection District (TFPD). Due to cumulative development the TFPD may require additional personnel and equipment to maintain current performance standards. 15 Expansion of existing facilities may be required to accommodate the additional equipment. This would be a significant cumulative impact and the proposed project would make a cumulatively considerable contribution.

**Mitigation Measure** Mitigation Measure 5.7-3 would be required for cumulative fire service impacts.

**Significance After Mitigation** Implementation of Mitigation Measure 5.7-3 would reduce cumulative fire service impacts to a less-than-significant cumulative impact.

**Police Services**

As discussed under Impact 5.7-5 Cumulative Increased Demand for Police Protection Services development on the project site together with cumulative development in the unincorporated areas of Marin County could generate additional demand for police services which would require the addition of seven deputies to maintain the current level of service ratio. 16 The proposed project is relatively small and would not significantly increase demands of police services, and therefore would make a

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14 Tiburon General Plan 2020 Draft EIR, op. cit., page 6.0-13


16 Marin Countywide Plan Update Draft EIR, op. cit., page 4.10-60.
less than cumulatively considerable contribution to the cumulative increased demand for police protection services.

**Water Supply**

As discussed under Impact 5.7-9 Cumulative Water Service Impact, cumulative development will result in increased water supply demands. Marin Municipal Water District (MMWD) plans to continue current conservation efforts and seeks additional viable water resources. The MMWD has stated that it has sufficient water supplies to meet project demand within the MMWD service area and plans to provide additional water to meet projected water shortages. This would be a less-than-significant cumulative impact.

**Wastewater Management**

As discussed under Impact 5.7-11 Increased Cumulative Wastewater Treatment Demand cumulative development would increase sewage treatment demands on Sanitary District No. 5. Existing and planned facilities, including the expanded Paradise Cove Treatment Plant would have sufficient capacity to meet the needs of the buildout of the service area. This would be a less-than-significant cumulative impact.

**Energy**

As discussed under Impact 5.7-14 Cumulative Energy Impacts cumulative development in the Tiburon Planning Area is expected to increase demand for energy consumption. This increase in demand would not exceed the capacity of PG&E’s electricity and gas systems or substantially impair PG&E’s ability to provide these services, and this would be a less-than-significant cumulative impact.

**Public Schools**

As discussed under Impact 5.7-17 Cumulative Public School Impacts both the Reed Union School District and the Tamalpais Union High School District would have adequate capacity to accommodate future students due to cumulative development. This would be a less-than-significant cumulative impact.

**Solid Waste**

As discussed under Impact 5.7-18 Project and Cumulative Increase Demand for Solid Waste Services Marin County’s Integrated Waste Management Plan indicates that the Redwood Landfill will have adequate capacity beyond 15 years and into the foreseeable future. Based on the available capacity it has been projected that Marin County can provide at least 15 years of permitted disposal capacity for all jurisdictions within the County. Therefore, this would be a less-than-significant cumulative impact.

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17 Nichols • Berman communication with Eric McGuire, Marin Municipal Water District, March 2008.

18 Marin Countywide Plan Update Draft EIR, op. cit., page 4.10-34.
VISUAL RESOURCES

Buildout of the Tiburon Planning Area could result in significant cumulative visual impacts where vacant lands visible from the San Francisco Bay are converted to developed land, and where new development would contribute to cumulative nighttime lighting and glare impacts. In the vicinity of the proposed project, other proposed residential developments have been approved and/or are currently being reviewed. This includes the Tiburon Glen Precise Development Plan, the Sorokko residential development, and the proposed Alta Robles Residential Development. Environmental documents prepared for the Sorokko project and the Tiburon Glen PDP determined that visual impacts would be less-than-significant. The Alta Robles Residential Development Draft EIR concluded that implementation of that project would result in significant and unavoidable visual impacts. As discussed in Section 5.8 Visual Quality the proposed project would result in significant unavoidable impacts to views from Tiburon Ridge (Impact 5.8-1), Heathcliff Drive (Impact 5.8-2), and Ayala Cove on Angel Island (Impact 5.8-4).

Based on cumulative development within the Planning Area, the Tiburon General Plan 2020 EIR previously identified significant cumulative impacts to scenic vistas and scenic resources plus significant ridgelines. Nighttime light and glare was also identified as a significant cumulative impact. The proposed project would make a cumulatively considerable contribution to cumulative visual impacts plus cumulative nighttime light and glare impacts.

Mitigation Measure Implementation of applicable design review policies and procedures together with implementation of the CWP policies would be required to reduce cumulative visual impacts. It would, however, be speculative to develop appropriate mitigation measures for project-specific impacts since details of cumulative developments are unknown.

As discussed in Mitigation Measure 5.8-6 individual projects would require the preparation of a Lighting Plan to mitigate light pollution impacts.

Significance After Mitigation Because visual impacts are project-specific it can not be determined if cumulative visual impacts would be reduced to a less-than-significant level. Therefore, visual impacts would be a significant unavoidable cumulative impact.

Implementation of Mitigation Measure 5.8-6 would, however, reduce cumulative nighttime light and glare impacts to a less-than-significant level.

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19 Tiburon General Plan 2020 Draft EIR, op. cit., page 6.0-15


21 Tiburon Glen Second Addendum to the August 2003 Final Environmental Impact Report, Nichols • Berman, November 2005, pages 5.0-10 through 5.0-19.


CULTURAL RESOURCES

While no known cultural resources exist at the project site, subsurface archeological deposits could be discovered during project grading and construction activities. Recommended mitigation measures would reduce such impacts to a less-than-significant level. Impacts to cultural and historical resources are typically limited to the proximity of development, thus cumulative development outside of the project site would not compound or increase the severity of impacts to cultural resources from implementation of the 2008 Easton Point Residential Development. However, as discussed in Section 5.9 Cultural Resources the project would result in a significant unavoidable impact to historical resources resulting from effects that would discontinue groundwater recharge to Keil Spring, and thus discontinue the existence of the spring as a historical resource (Impact 5.9-3 - Historic Significance of Keil Cove). This would be considered an incremental contribution to significant cumulative impacts on cultural resources throughout Marin County, however policies and programs contained in the CWP would require project sponsors to take appropriate measures to protect or preserve cultural resources affected by individual projects. Therefore, this would be a less-than-significant cumulative impact.

7.3 SIGNIFICANT UNAVOIDABLE IMPACTS

This section identifies significant unavoidable impacts, which are impacts that would remain significant and unavoidable even after implementation of proposed mitigation measures. In other words, implementation of proposed mitigation measures would not reduce the severity of anticipated impacts to a less-than-significant level. These potential significant and unavoidable impacts are as follows:

- **Impact 5.1-4** – Impact on Regional Roads.
- **Impact 5.3-1** - Construction Noise.
- **Impact 5.7-19** - Open Space Impacts
- **Impact 5.8-1** - View from the Tiburon Ridge (Viewpoint No. 1).
- **Impact 5.8-2** - View from Heathcliff Drive (Viewpoint No. 2).
- **Impact 5.8-4** - View from Ayala Cove on Angel Island (Viewpoint No. 4).

Additionally, implementation of the 2008 Easton Point Residential Development together with anticipated future projects would result in certain unavoidable cumulative impacts. These impacts are listed below:

- The impact to U.S. 101 would be a significant unavoidable cumulative impact.
- Impacts to air quality and greenhouse gas emissions would be significant unavoidable cumulative impacts.
- Construction noise would be a significant unavoidable cumulative impact.
- Loss and fragmentation of natural undeveloped habitat would be a significant unavoidable cumulative impact.
- Buildout of the Tiburon Planning Area would result in a significant unavoidable cumulative visual impact.

### 7.4 EFFECTS OF NO SIGNIFICANCE

As discussed in *Chapter 1.0 Introduction*, in accordance with the *State CEQA Guidelines*, no Initial Study was prepared since the preliminary review determined that an EIR would be required. While no Initial Study was prepared by Marin County for this EIR effort, an Initial Study was prepared in May 2000 for the *2001 Draft EIR*. Analyses completed as a part of this EIR, however, determined that the proposed *2008 Easton Point Residential Development* would have no or less-than-significant impacts for several significance criteria. These less-than-significant impacts are listed in the individual impact sections 5.1 through 5.9.
8.0 REPORT PREPARATION AND PERSONS CONSULTED
8.0 REPORT PREPARATION

8.1 REPORT PREPARERS

This EIR was prepared by an environmental study team led by Nichols • Berman under contract to Marin County. The analyses were coordinated primarily with John Roberto, Contract Planner, and David Zaltsman, Deputy County Counsel.

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TRANSPORTATION APPENDIX
PEAK HOUR VOLUME WARRANT #3
(Urban Area)

**NOTE**
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE

Source: Year 2003 Manual or Uniform Traffic Control Devices, Federal Highway Administration
## Summary Results

**Project Name:** Easton Point  
**Project and Baseline Years:** 2015 N/A

### Baseline CO₂e (metric tons/year)

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Baseline is currently: **OFF**

Baseline Project Name:
Go to Settings Tab to Turn On Baseline

## Detailed Results

### Unmitigated CO₂ (metric tons/year)

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<th>CH₄ (metric tons/year)</th>
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<td><strong>Natural Gas</strong></td>
<td>113.25</td>
<td>113.25</td>
<td>113.25</td>
<td>113.25</td>
<td>13.05%</td>
</tr>
<tr>
<td><strong>Water &amp; Wastewater</strong></td>
<td>8.33</td>
<td>8.33</td>
<td>8.33</td>
<td>8.33</td>
<td>0.96%</td>
</tr>
<tr>
<td><strong>Solid Waste</strong></td>
<td>61.87</td>
<td>61.87</td>
<td>61.87</td>
<td>61.87</td>
<td>7.13%</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Refrigerants</strong></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Sequestration</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Purchase of Offsets</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>867.91</td>
<td>867.91</td>
<td>867.91</td>
<td>867.91</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

* Several adjustments were made to transportation emissions after they have been imported from URBEMS.  
  After importing from URBEMS, CO₂ emissions are converted to metric tons and then adjusted to account for the "Pavley"  
  regulation. Then, CO₂ is converted to CO₂e by multiplying by 100/95 to account for the contribution of other GHGs (CH₄, N₂O, and HFCs) ([from leaking air conditioners])  
  Finally, CO₂e is adjusted to account for fossil fuel use.

### Mitigated CO₂ (metric tons/year)

<table>
<thead>
<tr>
<th>Source/Project</th>
<th>CO₂ (metric tons/year)</th>
<th>CH₄ (metric tons/year)</th>
<th>N₂O (metric tons/year)</th>
<th>CO₂e (metric tons/year)</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transportation</strong></td>
<td>588.81</td>
<td>588.81</td>
<td>588.81</td>
<td>588.81</td>
<td>67.84%</td>
</tr>
<tr>
<td><strong>Area Source</strong></td>
<td>0.58</td>
<td>0.58</td>
<td>0.58</td>
<td>0.58</td>
<td>0.07%</td>
</tr>
<tr>
<td><strong>Electricity</strong></td>
<td>95.07</td>
<td>95.07</td>
<td>95.07</td>
<td>95.07</td>
<td>10.95%</td>
</tr>
<tr>
<td><strong>Natural Gas</strong></td>
<td>113.25</td>
<td>113.25</td>
<td>113.25</td>
<td>113.25</td>
<td>13.05%</td>
</tr>
<tr>
<td><strong>Water &amp; Wastewater</strong></td>
<td>8.33</td>
<td>8.33</td>
<td>8.33</td>
<td>8.33</td>
<td>0.96%</td>
</tr>
<tr>
<td><strong>Solid Waste</strong></td>
<td>61.87</td>
<td>61.87</td>
<td>61.87</td>
<td>61.87</td>
<td>7.13%</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Refrigerants</strong></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Sequestration</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Purchase of Offsets</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>867.91</td>
<td>867.91</td>
<td>867.91</td>
<td>867.91</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
HYDROLOGY
APPENDIX
Clearwater Hydrology (CH), the Easton Point EIR hydrologist, conducted a peer review of the Drainage Report ¹ prepared by the applicant's civil engineer. Because the EIR hydrologist did not agree with the chosen runoff coefficients, "C" values, and the detention facility sizing routine presented in the Drainage Report, additional detention sizing calculations were prepared by the EIR hydrologist. This Technical Appendix provides documentation for the detention facility sizes presented in Exhibit 5.5-3 of the Draft EIR.

CH delineated areas discussed in the Drainage Report, or determined the appropriate area that should be delineated, if different from that discussed in the Drainage Report. These delineated areas were used in the detention analysis spreadsheets. When conducting the detention analysis, CH utilized additional impervious lot areas that the Drainage Report stated would drain to a particular detention facility. The detention facility and detention facility outfall locations are shown on Exhibit 5.5-5. ²

The Modified Rational Method, as described in Pond Sizing for Rational Formula Hydrographs, ³ was used to calculate the required detention volume to store the increase in post-development runoff during the 100-year storm event at each detention facility location (Exhibit 5.5-5). Land Development Solutions states in the Drainage Report that detention outflows will be maintained at the 10-year pre-development level through incorporation of an orifice or weir for metering flows. Outflow control devices will be designed once the dimensions of the detention facilities have been determined during the final project design phase, since outflow control design is directly related to detention facility dimensions.

Due to the layout of the proposed site roadways, local watershed concentration points (stormwater outfalls) were created at the outfall associated with each catch basin / detention system. To ensure peak flow rates are not increased at each detention facility outfall, the pre-development peak flow rate was calculated based on the predevelopment watershed area for each outfall location. The post-development peak flow rate was then calculated for the entire area contributing to the outfall location. Each post-development watershed area was larger than the pre-development watershed area due to proposed grading and roadway construction (except for Detention Facility #1 see HYDR-1). The peak flow rates were assessed in the manner described above to account

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² The detention facility and detention facility outfall locations are in the same locations as presented in the Drainage Report and on the Grading Plan, Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C-1A and C-1B, Backen Gillam, International Planning Associates, CSW/Stuber-Stroeh, revised January 29, 2009, for the proposed construction access road.

for modifications to drainage patterns of the site and ensure that the pre-project discharge to and through the culverts under Paradise Road will remain at pre-project levels, for the post-project 10-year to 100-year design storm.

Attached are spreadsheets documenting the detention facility sizing calculations. See Section 5.5 Hydrology and Water Quality of the Draft EIR for a further discussion regarding peak flow calculations and detention facility sizing.
Lot 7 (Per Land Development Solutions, Drainage Report January 29, 2009)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.13 acres</th>
<th>5715 sq.ft.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>5.00 min.</td>
<td>300 sec.</td>
</tr>
</tbody>
</table>

*Pervious area includes house footprint 3450 sq.ft. measured on CAD file + driveway 1065 sq.ft. measured on CAD file + assumed 1200 sq.ft. for patio


<table>
<thead>
<tr>
<th>100-Yr.</th>
<th>I (in/hr) = 4.85 in/hr</th>
<th>(Chart K, Zone A based on Tc - from Marin County Ration Method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-Yr.</td>
<td>I (in/hr) = 3.04 in/hr</td>
<td>0.627 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>100-Yr.</th>
<th>Qpre = 0.25 cfs</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-Yr.</td>
<td>Qpre = 0.16 cfs</td>
</tr>
</tbody>
</table>

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.13</td>
<td>5715 sq.ft.</td>
<td>1.00</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.13 acres</td>
<td>5715 sq.ft.</td>
<td>0.95</td>
</tr>
</tbody>
</table>

0.95 = Composite C

*All pre-development pervious assumed to be converted to impervious

Tc = 5.00 min. 300 sec.

<table>
<thead>
<tr>
<th>100-Yr.</th>
<th>I (in/hr) = 4.85 in/hr</th>
<th>(from Chart K, Zone A based on Tc - from Marin County Ration Method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-Yr.</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>100-Yr.</th>
<th>Qpost = 0.60 cfs</th>
</tr>
</thead>
</table>

Detention Basin Sizing

Post-Dev Composite C = 0.95

Post-Dev Area = 0.13 acres

Outflow Index = 1.02

Critical Storm Duration (D) = 23 min 1380 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)

Critical Storm Intensity = 2.33 in/hr (From Fig 2 - Aron and Kibler 1990)

Critical Peak Flow (Qp) = 0.29 cfs

Required Detention

Pond Volume = 187 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>Pre-development</th>
<th>Post-development</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.71 acres</td>
<td>31075 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>C value = 0.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 476 ft
Elevation change = 60 ft
Overland Flow slope (s) = 0.13

Tc(watershed) = 16.81 min. 1009 sec.

100-Yr. I (in/hr) = 2.50 in/hr
10-Yr. I (in/hr) = 1.81 in/hr

(Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpre = 0.71 cfs
10-Yr. Qpre = 0.46 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Pervious</th>
<th>Impervious*</th>
<th>Area Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.40 acres</td>
<td>0.08 acres</td>
<td>0.48 acres</td>
</tr>
<tr>
<td>17435 sq.ft.</td>
<td>3420 sq.ft.</td>
<td>20845 sq.ft.</td>
</tr>
<tr>
<td>0.84</td>
<td>0.95</td>
<td>1.16</td>
</tr>
<tr>
<td>0.4</td>
<td>0.95</td>
<td>0.49 = Composite C</td>
</tr>
</tbody>
</table>

* roadway 3420 sq.ft. measured on CAD

Overland Flow distance (L) = 110 ft
Elevation change = 14 ft
Overland Flow slope (s) = 0.02

Tt = 15.49 min. 929 sec.

Roadway Flow distance (L) = 72 ft
Elevation change = 0 ft
Overland Flow slope (s) = 0.03

V = 4.91 ft/sec
Tt = 0.24 min 15 sec.

Pipe Flow distance (L) = 128 ft
Elevation change = 22 ft
Overland Flow slope (s) = 0.17 *

V** = 22.24 ft/sec
Tt = 0.10 min 6 sec

Tc = 15.83 min 950 sec

100-Yr. I (in/hr) = 2.52 in/hr
100-Yr. Qpost = 0.59 cfs

(Chart K, Zone A based on Tc - from Marin County Ration Method)

Due to the reduced watershed area contributing to the Point of Concentration under design conditions
Pre-development peak flow rates are greater than Post-development peak flow rates, thus no detention is required.

Detention Basin Sizing

Post-Dev Composite C = 0.49
Post-Dev Area = 0.48 acres
Outflow Index = 1.52
Critical Storm Duration (D) = 15 min 900 sec
Critical Storm Intensity = 1.95 in/hr
Critical Peak Flow (Qp) = 0.46 cfs

Required Detention
Pond Volume = -246 ft^3

(From Aron = Qo/(2*C*A) Qo = Pre-development peak flow
Critical Storm Duration Curves (Fig 2) - Aron and Kibler 1990)
(From Fig 3) - Aron and Kibler 1990
(From equation 3 - Aron and Kibler 1990)
D-2 Design Drainage Basin (Per Land Development Solutions, Drainage Report January 29, 2009)

Pre-development Peak Flow Rate

Area = 0.25 acres 10915 sq.ft.
C value = 0.4

Overland Flow distance (L) = 308 ft
Elevation change = 46 ft
Overland Flow slope (s) = 0.15

Tc(watershed) = 13.98 min. 838.7593 sec.

<table>
<thead>
<tr>
<th></th>
<th>100-Yr.</th>
<th>10-Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (in/hr) =</td>
<td>2.70 in/hr</td>
<td>1.73 in/hr</td>
</tr>
<tr>
<td>(Chart K, Zone A based on Tc - from Marin County Ration Method)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-Yr. Qpre (Qo) =</td>
<td>0.27 cfs</td>
<td>0.17 cfs</td>
</tr>
</tbody>
</table>

Post-development Peak Flow Rate

Area | % Total | C value | Weighted C | Composite C
--- | --- | --- | --- | ---
Pervious | 0.15 acres | 6654 sq.ft. | 0.56 | 0.4 | 0.22
Impervious* | 0.12 acres | 5229 sq.ft. | 0.44 | 0.95 | 0.42
Area Total | 0.27 acres | 11883 sq.ft. | | | 0.64 = Composite C

* roadway 5229 sq.ft. measure on CAD

Overland Flow distance (L) = 201 ft
Elevation change = 32 ft
Overland Flow slope (s) = 0.16

Tc(watershed) = 9.65 min. 578.75 sec.

<table>
<thead>
<tr>
<th></th>
<th>100-Yr.</th>
<th>10-Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (in/hr) =</td>
<td>3.40 in/hr</td>
<td></td>
</tr>
<tr>
<td>(from Chart K, Zone A based on Tc - from Marin County Ration Method)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-Yr. Qpost =</td>
<td>0.60 cfs</td>
<td></td>
</tr>
</tbody>
</table>

Detention Basin Sizing

Post-Dev Composite C = 0.64
Post-Dev Area = 0.27 acres
Outflow Index = 0.77
(Critical Storm Duration (D) = 28 min 1680 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 2 in/hr
Critical Peak Flow (Qp) = 0.35 cfs

Required Detention
Pond Volume = 283 ft^3
(Vp = (Qp*D) - Qo*(D+Tc)/2)

(From equation 3 - Aron and Kibler 1990)
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>0.27 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>374 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>70 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.19</td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>14.18 min. 851 sec.</td>
</tr>
</tbody>
</table>

100-Yr. I (in/hr) = 2.70 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 1.73 in/hr 0.64 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.29 cfs
10-Yr. Qpre = 0.18 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Component</th>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.57 acres</td>
<td>24862 sq.ft.</td>
<td>0.76</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.18 acres</td>
<td>7903 sq.ft.</td>
<td>0.24</td>
<td>0.95</td>
</tr>
<tr>
<td>Total</td>
<td>0.75 acres</td>
<td>32765 sq.ft.</td>
<td>0.53</td>
<td>0.30</td>
</tr>
</tbody>
</table>

*driveway and roof 4359 sq.ft. measured on CAD file, patio assumption of 1200sq.ft. from Drainage Report
roadway 2344 sq.ft. measured on CAD file

Overland Flow distance (L) = 245 ft
Elevation change = 50 ft
Overland Flow slope (s) = 0.20
Tt = 12.22 min. 733 sec.

Roadway Flow distance (L) = 147 ft
Elevation change = 49 ft
Overland Flow slope (s) = 0.18
V = 12.02
Tt = 0.20 min 12 sec.

Tc = 12.42 min 745 sec

100-Yr. I (in/hr) = 2.90 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)
100-Yr. Qpost = 1.16 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.53
Post-Dev Area = 0.75 acres
Outflow Index* = 0.36 (From Aron = Qo/(2*C*A) Qo = Pre-development peak flow
Critical Storm Duration (D) = 49 min 2940 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.3 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.52 cfs

Required Detention
Pond Volume = 1003 ft^3
Vp = (Qp*D) - Qo*(D+Tc)/2
Pre-development Peak Flow Rate

Area = 2.58 acres 112370 sq.ft.
C value = 0.4

Overland Flow distance (L) = 617 ft
Elevation change = 98 ft
Overland Flow slope (s) = 0.16

\[ Tc(\text{watershed}) = 17.45 \text{ min.} 1047 \text{ sec.} \]

100-Yr. I (in/hr) = 2.40 in/hr
10-Yr. I (in/hr) = 1.55 in/hr

100-Yr. Qpre = 2.48 cfs
10-Yr. Qpre = 1.59 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>120110 sq.ft.</td>
<td>0.75</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>39519 sq.ft.</td>
<td>0.25</td>
<td>0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>159629 sq.ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*driveway and roof 12,491 sq.ft. measured on CAD file for Lots 20, 24 and 35, patio assumption for the three lots of 3600sq.ft. from Drainage Report + roadway 23,428 sq.ft. measured on CAD file

Roadway Flow distance (L) = 364 ft
Elevation change = ft
Overland Flow slope (s) = 0.02

\[ V = 4.01 \quad \text{use Manning's to approximate velocity of flow in gutter} \]
\[ Tt = 1.51 \text{ min} 91 \text{ sec.} \quad \text{assumed flow depth of 4 in., 0.5ft flat section and then slope so area of flow is 2 ft. wide at surface} \]

Pipe Flow distance (L) = 603 ft
Elevation change = 58 ft
Overland Flow slope (s) = 0.10 *

\[ V^* = 16.63 \text{ ft/sec} \quad **use Manning's for pipe flow from Hydraulics 1949 H. King \]
\[ Tt^* = 0.60 \text{ min} 36 \text{ sec} \quad V = (0.59/n)*D^{(2/3)}*S^{0.5} \]

\[ Tc = 2.12 \text{ min} 127 \text{ sec} \]

100-Yr. I (in/hr) = 4.85 in/hr
100-Yr. Qpost = 9.53 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.54
Post-Dev Area = 3.66 acres
Outflow Index = 0.63
Critical Storm Duration (D) = 31 min 1860 sec
Critical Storm Intensity = 1.95 in/hr
Critical Peak Flow (Qp) = 3.83 cfs

\[ Q_o = \text{Pre-development peak flow from Drainage Report} \]
\[ P = (Qp^2) - Qo^2(D+Tc)/2 \]

\[ V_p = (Qp^2) - Qo^2(D-Tc)/2 \]

\[ \text{Required Detention} = 4666 \text{ ft}^3 \]
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>1.77 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>493 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>102 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.21</td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>15.19 min</td>
</tr>
<tr>
<td>100-Yr. I (in/hr)</td>
<td>2.60 in/hr</td>
</tr>
<tr>
<td>10-Yr. I (in/hr)</td>
<td>1.67 in/hr</td>
</tr>
</tbody>
</table>

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>2.49 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.73</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.91 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.27</td>
</tr>
<tr>
<td>Area Total</td>
<td>3.41 acres</td>
</tr>
<tr>
<td>Weighted C</td>
<td>0.29</td>
</tr>
<tr>
<td>Overall Composite C</td>
<td>0.55</td>
</tr>
</tbody>
</table>

Roadway Flow distance (L) = 655 ft
Elevation change = 0.01 ft
Overland Flow slope (s) = 0.01
V = 2.83
Tt = 3.85 min

Roadway Flow distance (L) = 275 ft
Elevation change = 0.12 ft
Overland Flow slope (s) = 0.12
V = 9.96
Tt = 0.46 min

Pipe Flow distance (L) = 525 ft
Elevation change = 96 ft
Overland Flow slope (s) = 0.18

V** = 22.94 ft/sec
Tt = 0.38 min

Detention Basin Sizing

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Composite C</td>
<td>0.55</td>
</tr>
<tr>
<td>Post-Dev Area</td>
<td>3.41 acres</td>
</tr>
<tr>
<td>Critical Storm Duration (D)</td>
<td>40 min</td>
</tr>
<tr>
<td>Critical Storm Intensity</td>
<td>1.6 in/hr</td>
</tr>
<tr>
<td>Critical Peak Flow (Qp)</td>
<td>2.98 cfs</td>
</tr>
<tr>
<td>Required Detention</td>
<td></td>
</tr>
<tr>
<td>Pond Volume</td>
<td>4688 ft^3</td>
</tr>
</tbody>
</table>
D-6A Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

\[
\text{Area} = 0.03 \text{ acres} \quad 1122 \text{ sq.ft.} \\
\text{C value} = 0.4 \\
\text{Overland Flow distance (L)} = 105 \text{ ft} \\
\text{Elevation change} = 35 \text{ ft} \\
\text{Overland Flow slope (s)} = 0.33 \\
\text{Tc(watershed)} = 9.01 \text{ min.} \quad 541 \text{ sec.} \\
100-\text{Yr.} \quad \text{I (in/hr)} = 3.50 \text{ in/hr} \\
10-\text{Yr.} \quad \text{I (in/hr)} = 2.22 \text{ in/hr} \\
100-\text{Yr.} \quad \text{Q}_{pre} = 0.04 \text{ cfs} \\
10-\text{Yr.} \quad \text{Q}_{pre} = 0.02 \text{ cfs} \\
\]

Post-development Peak Flow Rate

\[
\begin{array}{cccc}
\text{Area} & \text{Total} & \text{C value} & \text{Weighted C} \\
\text{Pervious} & 0.25 \text{ acres} & 10857 \text{ sq.ft.} & 0.72 & 0.4 & 0.29 \\
\text{Impervious*} & 0.10 \text{ acres} & 4236 \text{ sq.ft.} & 0.28 & 0.95 & 0.27 \\
\text{Area Total} & 0.35 \text{ acres} & 15093 \text{ sq.ft.} & & & 0.55 = \text{Composite C} \\
\end{array} \\
*\text{construction road 4236 sq.ft. measured on CAD file} \\
\text{Overland Flow distance (L)} = 104 \text{ ft} \\
\text{Elevation change} = 35 \text{ ft} \\
\text{Overland Flow slope (s)} = 0.34 \\
\text{Tt} = 8.98 \text{ min.} \quad 539 \text{ sec.} \\
\text{Roadway Flow distance (L)} = 37 \text{ ft} \\
\text{Elevation change} = \text{ft} \\
\text{Overland Flow slope (s)} = 0.27 \\
\text{V} = 14.73 \\
\text{Tt} = 0.04 \text{ min} \quad 3 \text{ sec.} \\
\text{Tc} = 9.02 \text{ min} \quad 541 \text{ sec} \\
100-\text{Yr.} \quad \text{I (in/hr)} = 3.50 \text{ in/hr} \\
100-\text{Yr.} \quad \text{Q}_{post} = 0.67 \text{ cfs} \\
\]

Detention Basin Sizing

\[
\text{Post-Dev Composite C} = 0.55 \\
\text{Post-Dev Area} = 0.35 \text{ acres} \\
\text{Outflow Index} = 0.09 \\
\text{Critical Storm Duration (D)} = 50 \text{ min} \quad 5400 \text{ sec} \\
\text{Critical Storm Intensity} = 0.9 \text{ in/hr} \\
\text{Critical Peak Flow (Qp)} = 0.17 \text{ cfs} \\
\text{Required Detention} \\
\text{Pond Volume} = 826 \text{ ft}^3 \\
\text{Vp} = (Qp^*D) - Qo^*(D+Tc)/2 \\
\]

(From Chart K, Zone A based on Tc - from Marin County Ration Method)

(From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)

(From Fig 2 - Aron and Kibler 1990)
D-6B Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

\[
\begin{array}{|c|c|c|}
\hline
\text{Area} & 0.03 \text{ acres} & 1521 \text{ sq.ft.} \\
\text{C value} & 0.4 & \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|}
\hline
\text{Overland Flow distance (L)} & 121 \text{ ft} \\
\text{Elevation change} & 40 \text{ ft} \\
\text{Overland Flow slope (s)} & 0.33 \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|c|}
\hline
\text{Tc(watershed)} & 9.32 \text{ min.} & 559 \text{ sec.} \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|}
\hline
\text{100-Yr. I (in/hr)} & 3.40 \text{ in/hr} \\
\text{10-Yr. I (in/hr)} & 2.16 \text{ in/hr} \\
\hline
\end{array}
\]

\[
\begin{array}{|c|}
\hline
\text{100-Yr. Qpre} \\
\text{10-Yr. Qpre} \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|}
\hline
\text{100-Yr. Qpre} & 0.05 \text{ cfs} \\
\text{10-Yr. Qpre} & 0.03 \text{ cfs} \\
\hline
\end{array}
\]

Post-development Peak Flow Rate

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{Pervious} & 0.09 \text{ acres} & 3722 \text{ sq.ft.} & 0.68 & 0.4 & 0.27 \\
\text{Impervious*} & 0.04 \text{ acres} & 1719 \text{ sq.ft.} & 0.32 & 0.95 & 0.30 \\
\text{Area Total} & 0.12 \text{ acres} & 5441 \text{ sq.ft.} & & & 0.57 = \text{Composite C} \\
\hline
\end{array}
\]

\[
\text{*construction road 1719 sq.ft. measured on CAD file}
\]

\[
\begin{array}{|c|c|}
\hline
\text{Overland Flow distance (L)} & 121 \text{ ft} \\
\text{Elevation change} & 40 \text{ ft} \\
\text{Overland Flow slope (s)} & 0.33 \\
\hline
\text{Tc} & 9.32 \text{ min.} & 559 \text{ sec.} \\
\hline
\end{array}
\]

\[
\begin{array}{|c|}
\hline
\text{100-Yr. I (in/hr)} & 3.40 \text{ in/hr} \\
\hline
\end{array}
\]

\[
\begin{array}{|c|}
\hline
\text{100-Yr. Qpost} \\
\hline
\end{array}
\]

\[
\begin{array}{|c|}
\hline
\text{0.24 cfs} \\
\hline
\end{array}
\]

Detention Basin Sizing

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Post-Dev Composite C} & 0.57 \\
\text{Post-Dev Area} & 0.12 \text{ acres} \\
\text{Outflow Index} & 0.33 \\
\text{Critical Storm Duration (D)} & 54 \text{ min} & 3240 \text{ sec} \\
\text{Critical Storm Intensity} & 1.25 \text{ in/hr} & \text{From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990} \\
\text{Critical Peak Flow (Qp)} & 0.09 \text{ cfs} & \text{From Fig 2 - Aron and Kibler 1990} \\
\hline
\end{array}
\]

\[
\begin{array}{|c|}
\hline
\text{Required Detention} \\
\text{Pond Volume} & 200 \text{ ft}^3 \\
\hline
\end{array}
\]

\[
\text{Vp = (Qp*D - Qo*(D+Tc))/2}
\]
D-6C Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.05 acres</th>
<th>2007 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 123 ft
Elevation change = 38 ft
Overland Flow slope (s) = 0.31

Tc(watershed) = 9.45 min. 567 sec.

100-Yr. I (in/hr) = 3.40 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 2.16 in/hr 0.636 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.06 cfs
10-Yr. Qpre = 0.04 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.14 acres</td>
<td>5942 sq.ft.</td>
<td>0.69</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.06 acres</td>
<td>2680 sq.ft.</td>
<td>0.31</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.20 acres</td>
<td>8622 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

0.57 = Composite C

*construction road 2680 sq.ft. measured on CAD file

Overland Flow distance (L) = 114 ft
Elevation change = 30 ft
Overland Flow slope (s) = 0.26

Tt = 9.52 min. 571 sec.

Roadway Flow distance (L) = ft
Elevation change = ft minimal time on road
Overland Flow slope (s) = ignore

V = 0.00
Tt = 0.00 min 0 sec. use Manning's to approximate velocity of flow in gutter assumed flow depth of 0.1ft. and road section slope of 0.02

Tc = 9.52 min 571 sec

100-Yr. I (in/hr) = 3.40 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.38 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.57
Post-Dev Area = 0.20 acres
Outflow Index = 0.28 (From Aron = Qo/(2*C*A)) Qo = Pre-development peak flow
Critical Storm Duration (D) = 57 min 3420 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.2 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.14 cfs

Required Detention (From equation 3 - Aron and Kibler 1990)
Pond Volume = 339 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
### Pre-development Peak Flow Rate

- **Area** = 0.04 acres, 1747 sq.ft.
- **C value** = 0.4

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overland Flow distance (L)</td>
<td>168 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>42 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.25</td>
</tr>
<tr>
<td>Tc (watershed)</td>
<td>10.59 min.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Rate (in/hr)</th>
<th>Area Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Yr.</td>
<td>3.20</td>
<td>0.23 acres</td>
</tr>
<tr>
<td>10-Yr.</td>
<td>2.04</td>
<td>0.23 acres</td>
</tr>
</tbody>
</table>

**100-Yr. Qpre = 0.05 cfs**

**10-Yr. Qpre = 0.03 cfs**

### Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Type</th>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.13 acres</td>
<td>5661 sq.ft.</td>
<td>0.57</td>
<td>0.23</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.10 acres</td>
<td>4236 sq.ft.</td>
<td>0.43</td>
<td>0.41</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.23 acres</td>
<td>9897 sq.ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**0.64 = Composite C**

*construction road 4236 sq.ft. measured on CAD file

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overland Flow distance (L)</td>
<td>169 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>45 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.27</td>
</tr>
<tr>
<td>Tt</td>
<td>10.49 min.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Rate (in/hr)</th>
<th>Area = 0.4125</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Yr.</td>
<td>3.20</td>
<td></td>
</tr>
</tbody>
</table>

**100-Yr. Qpost = 0.46 cfs**

### Detention Basin Sizing

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Composite C</td>
<td>0.64</td>
</tr>
<tr>
<td>Post-Dev Area</td>
<td>0.23 acres</td>
</tr>
<tr>
<td>Outflow Index</td>
<td>0.18</td>
</tr>
<tr>
<td>Critical Storm Duration (D)</td>
<td>72 min</td>
</tr>
<tr>
<td>Critical Storm Intensity</td>
<td>1 in/hr</td>
</tr>
<tr>
<td>Critical Peak Flow (Qp)</td>
<td>0.14 cfs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Rate (in/hr)</th>
<th>Area = 496 ft³</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Yr.</td>
<td>3.20</td>
<td></td>
</tr>
</tbody>
</table>

**Required Detention**

**Pond Volume = 496 ft³**

(From equation 3 - Aron and Kibler 1990)
D-6E Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.05 acres</th>
<th>2007 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 91 ft
Elevation change = 40 ft
Overland Flow slope (s) = 0.44

Tc(watershed) = 8.41 min. 504 sec.

100-Yr. I (in/hr) = 3.65 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 2.32 in/hr 0.6345 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.07 cfs
10-Yr. Qpre = 0.04 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.07 acres</td>
<td>3233 sq.ft.</td>
<td>0.58</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.05 acres</td>
<td>2302 sq.ft.</td>
<td>0.42</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.13 acres</td>
<td>5535 sq.ft.</td>
<td>0.63 = Composite C</td>
</tr>
</tbody>
</table>

*construction road 2302 sq.ft. measured on CAD file

Overland Flow distance (L) = 93 ft
Elevation change = 38 ft
Overland Flow slope (s) = 0.41

Tt = 8.53 min. 512 sec.

Roadway Flow distance (L) = ft
Elevation change = ft minimal time on road
Overland Flow slope (s) = ignore

V = 0.00
use Manning's to approximate velocity of flow in gutter

Tt = 0.00 min 0 sec. assumed flow depth of 0.1ft. and road section slope of 0.02

Tc = 8.53 min 512 sec

100-Yr. I (in/hr) = 3.60 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.29 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.63
Post-Dev Area = 0.13 acres
Outflow Index = 0.42
Critical Storm Duration (D) = 44 min 2640 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.5 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.12 cfs

Required Detention
Pond Volume = 210 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.02 acres</th>
<th>1073 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 87 ft
Elevation change = 32 ft
Overland Flow slope (s) = 0.37

Tc(watershed) = 8.53 min. 512 sec.

100-Yr. I (in/hr) = 3.60 in/hr  
10-Yr. I (in/hr) = 2.29 in/hr

100-Yr. Qpre = 0.04 cfs 
10-Yr. Qpre = 0.02 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.08 acres</td>
<td>3349 sq.ft.</td>
<td>0.81</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.02 acres</td>
<td>762 sq.ft.</td>
<td>0.19</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.09 acres</td>
<td>4111 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

*construction road 762 sq.ft. measured on CAD file

Tc = 9.39 min. 564 sec.

100-Yr. I (in/hr) = 3.45 in/hr  
(from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.16 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.50
Post-Dev Area = 0.09 acres

Outflow Index = 0.37  
(Critical Storm Duration (D) = 49 min 2940 sec  
Critical Peak Flow (Qp) = 1.33 in/hr  
Critical Storm Intensity = 0.06 cfs

Required Detention = 123 ft^3  
Vp = (Qp*D) - Qo*(D+Tc)/2
D-6G Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.08 acres</th>
<th>3561 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 214 ft
Elevation change = 75 ft
Overland Flow slope (s) = 0.35

Tc(watershed) = 10.63 min. 638 sec.

100-Yr. I (in/hr) = 3.20 in/hr
10-Yr. I (in/hr) = 2.04 in/hr

100-Yr. Qpre = 0.10 cfs
10-Yr. Qpre = 0.07 cfs

(Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.30 cfs
10-Yr. Qpost = 0.20 cfs

(Chart K, Zone A based on Tc - from Marin County Ration Method)

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.07 acres</td>
<td>3065 sq.ft.</td>
<td>0.53</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.06 acres</td>
<td>2693 sq.ft.</td>
<td>0.47</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.13 acres</td>
<td>5758 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

*construction road 2693 sq.ft. measured on CAD file

Overland Flow distance (L) = 136 ft
Elevation change = 45 ft
Overland Flow slope (s) = 0.33

Tc = 9.58 min. 575 sec.

100-Yr. I (in/hr) = 3.45 in/hr
(from Chart K, Zone A based on Tc - from Marin County Ration Method)

Detention Basin Sizing

Post-Dev Composite C = 0.66
Post-Dev Area = 0.13 acres

Outflow Index = 0.60 (From Aron = Qo/(2*C*A) Qo = Pre-development peak flow

Critical Storm Duration (D) = 35 min 2100 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.65 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.14 cfs

Required Detention = 161 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
D-6H Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

Area = 0.12 acres  5127 sq.ft.
C value = 0.4

Overland Flow distance (L) = 260 ft
Elevation change = 75 ft
Overland Flow slope (s) = 0.29

Tc(watershed) = 11.62 min.  697 sec.

100-Yr.  I (in/hr) = 3.00 in/hr  (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr.  I (in/hr) = 1.91 in/hr  0.638 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr.  Qpre = 0.14 cfs
10-Yr.  Qpre = 0.09 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Pervious</th>
<th>Area Total</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.13 acres</td>
<td>0.21 acres</td>
<td>0.59</td>
<td>0.65</td>
<td>0.26</td>
</tr>
</tbody>
</table>

*construction road 3140 sq.ft. measured on CAD file

Overland Flow distance (L) = 167 ft
Elevation change = 53 ft
Overland Flow slope (s) = 0.32

Tt = 10.14 min.  609 sec.

100-Yr.  I (in/hr) = 3.25 in/hr  (from Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr.  Qpre = 0.40 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.59
Post-Dev Area = 0.21 acres
Outflow Index = 0.58 (From Aron = Qo/(2*C*A))
Critical Storm Duration (D) = 35 min  2100 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.75 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.21 cfs

Required Detention
Pond Volume = 257 ft*3
Vp = (Qp*D) - Qo*(D+Tc)/2

Assumed flow depth of 0.1ft. and road section slope of 0.02
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.07 acres 2972 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 108 ft  
Elevation change = 38 ft  
Overland Flow slope (s) = 0.35

Tc(watershed) = 9.00 min. 540 sec.

100-Yr. I (in/hr) = 3.50 in/hr  
(Chart K, Zone A based on Tc - from Marin County Ration Method)

10-Yr. I (in/hr) = 2.23 in/hr  
0.636 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.10 cfs
10-Yr. Qpre = 0.06 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.10 acres 4377 sq.ft.</td>
<td>0.53</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.09 acres 3855 sq.ft.</td>
<td>0.47</td>
<td>0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.19 acres 8232 sq.ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*roadway 3855 sq.ft. measured on CAD file

Overland Flow distance (L) = 63 ft  
Elevation change = 21 ft  
Overland Flow slope (s) = 0.33

Tt = 8.11 min. 486 sec.

Roadway Flow distance (L) = 73 ft  
Elevation change = 12 ft  
Overland Flow slope (s) = 0.043

V = 5.88  
use Manning's to approximate velocity of flow in gutter

Tt = 0.21 min 12 sec.  
assumed flow depth of 4 in., 0.5ft flat section and then slope so area of flow is 2 ft. wide at surface

Pipe Flow distance (L) = 28 ft  
Elevation change = 14 ft  
Overland Flow slope (s) = 0.50 *

V** = 37.93 ft/sec  
**use Manning's for pipe flow from Hydraulics 1949 H. King

Tt = 0.01 min 1 sec  
V = (0.59/n)*D^(2/3)*S^0.5

Tc = 8.33 min 500 sec

100-Yr. I (in/hr) = 3.60 in/hr  
(from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.45 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.66

Post-Dev Area = 0.19 acres

Outflow Index = 0.38  
(From Aron = Qo/(2*C*A)  Qo = Pre-development peak flow

Critical Storm Duration (D) = 47 min 2620 sec  
(From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)

Critical Storm Intensity = 1.33 in/hr  
(From Fig 2 - Aron and Kibler 1990)

Critical Peak Flow (Qp) = 0.17 cfs

Required Detention = 308 ft^3  
Vp = (Qp*D) - Qo*(D+Tc)/2
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.06 acres</th>
<th>2428 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 140 ft
Elevation change = 36 ft
Overland Flow slope (s) = 0.26

Tc(watershed) = 10.05 min. 603 sec.

100-Yr. I (in/hr) = 3.30 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 2.10 in/hr (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.07 cfs
10-Yr. Qpre = 0.05 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.19 acres</td>
<td>8065 sq.ft.</td>
<td>0.69</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.08 acres</td>
<td>3672 sq.ft.</td>
<td>0.31</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.27 acres</td>
<td>11737 sq.ft.</td>
<td>0.57</td>
</tr>
</tbody>
</table>

*roadway 3672 sq.ft. measured on CAD file

Overland Flow distance (L) = 83 ft
Elevation change = 21 ft
Overland Flow slope (s) = 0.25

Tt = 8.91 min. 535 sec.

Roadway Flow distance (L) = 100 ft
Elevation change = 100 ft
Area = 0.4125
Overland Flow slope (s) = 0.035

V = 5.30
Tt = 0.31 min 19 sec. assumed flow depth of 4 in., 0.5ft flat section and then slope so area of flow is 2 ft. wide at surface

Pipe Flow distance (L) = 20 ft
Elevation change = 10 ft
Overland Flow slope (s) = 0.75 *

V** = 46.45 ft/sec **use Manning's for pipe flow from Hydraulics 1949 H. King
Tt = 0.01 min 0 sec

Tc = 9.23 min 554 sec

100-Yr. I (in/hr) = 3.40 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)
100-Yr. Qpost = 0.52 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.57
Post-Dev Area = 0.27 acres
Outflow Index = 0.24 (From Aron = Qo/(2*C*A) Qo = Pre-development peak flow
Critical Storm Duration (D) = 63 min 3780 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.2 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.18 cfs

Required Detention (From equation 3 - Aron and Kibler 1990)
Pond Volume = 540 ft^3
Vp = (Qp*D) - Qo*(D+Tc)/2
D-17 Design Drainage Basin (Per Land Development Solutions, Drainage Report January 29, 2009)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.17 acres</th>
<th>7390 sq.ft.</th>
<th>C value</th>
<th>0.4</th>
</tr>
</thead>
</table>

Overland Flow distance (L) = 140 ft
Elevation change = 43 ft
Overland Flow slope (s) = 0.31

Tc(watershed) = 9.76 min. 586 sec.

100-Yr. I (in/hr) = 3.35 in/hr  (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 2.13 in/hr  0.636 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.23 cfs
10-Yr. Qpre = 0.14 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>Area Total</th>
<th>0.70 = Composite C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.20 acres</td>
<td>8713 sq.ft.</td>
<td>0.45 0.4 0.18</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.24 acres</td>
<td>10592 sq.ft.</td>
<td>0.55 0.95 0.52</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.44 acres</td>
<td>19305 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

*roadway 10,592 sq.ft. measured on CAD file

Overland Flow distance (L) = 140 ft
Elevation change = 43 ft
Overland Flow slope (s) = 0.31

Tc = 9.76 min. 586 sec.

100-Yr. I (in/hr) = 3.35 in/hr  (from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 1.04 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.70
Post-Dev Area = 0.44 acres

Outflow Index= 0.37  (From Aron = Qo/(2*C*A) Qo = Pre-development peak flow
Critical Storm Duration (D) = 47 min 2820 sec  (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.33 in/hr  (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.41 cfs

Required Detention
Pond Volume = 779 ft^3  (From equation 3 - Aron and Kibler 1990)

Vp = (Qp*D) - Qo*(D+Tc)/2
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>2.19 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>524 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>182 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.35</td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>13.84 min.</td>
</tr>
<tr>
<td></td>
<td>830 sec.</td>
</tr>
<tr>
<td>100-Yr. I (in/hr)</td>
<td>2.75 in/hr</td>
</tr>
<tr>
<td>(Chart K, Zone A based on Tc - from Marin County Ration Method)</td>
<td></td>
</tr>
<tr>
<td>10-Yr. I (in/hr)</td>
<td>1.76 in/hr</td>
</tr>
<tr>
<td>(Rd,10 from Chart K, Zone A - from Marin County Ration Method)</td>
<td></td>
</tr>
<tr>
<td>100-Yr. Qpre</td>
<td>2.41 cfs</td>
</tr>
<tr>
<td>10-Yr. Qpre</td>
<td>1.55 cfs</td>
</tr>
</tbody>
</table>

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Classification</th>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>2.40 acres</td>
<td>0.91</td>
<td>0.4</td>
<td>0.36</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.23 acres</td>
<td>0.09</td>
<td>0.95</td>
<td>0.08</td>
</tr>
<tr>
<td>Area Total</td>
<td>2.63 acres</td>
<td>1.00</td>
<td>0.45</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>114703 sq.ft.</td>
<td>0.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*roadway 10,164 sq.ft. measured on CAD file

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overland Flow distance (L)</td>
<td>524 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>182 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.35</td>
</tr>
<tr>
<td>Tc</td>
<td>13.84 min.</td>
</tr>
<tr>
<td></td>
<td>830 sec.</td>
</tr>
<tr>
<td>100-Yr. I (in/hr)</td>
<td>2.75 in/hr</td>
</tr>
<tr>
<td>(from Chart K, Zone A based on Tc - from Marin County Ration Method)</td>
<td></td>
</tr>
<tr>
<td>100-Yr. Qpost</td>
<td>3.25 cfs</td>
</tr>
</tbody>
</table>

Detention Basin Sizing

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Composite C</td>
<td>0.45</td>
</tr>
<tr>
<td>Post-Dev Area</td>
<td>2.63 acres</td>
</tr>
<tr>
<td>Outflow Index</td>
<td>1.02</td>
</tr>
<tr>
<td>Critical Storm Duration (D)</td>
<td>24 min</td>
</tr>
<tr>
<td>Critical Storm Intensity</td>
<td>2.33 in/hr</td>
</tr>
<tr>
<td>Critical Peak Flow (Qp)</td>
<td>2.75 cfs</td>
</tr>
</tbody>
</table>

Required Detention

\[ V_p = (Q_p^*D) - Q_o^*(D+T_c)/2 \]

\[ (From \ equation \ 3 - Aron \ and \ Kibler \ 1990) \]

\[ V_p = (1224 \ ft^3) \]

\[ (From \ equation \ 3 - Aron \ and \ Kibler \ 1990) \]
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.14 acres</th>
<th>5991 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 247 ft
Elevation change = 95 ft
Overland Flow slope (s) = 0.38

Tc(watershed) = 10.87 min. 652 sec.

100-Yr. I (in/hr) = 3.15 in/hr
10-Yr. I (in/hr) = 2.01 in/hr

100-Yr. Qpre = 0.17 cfs
10-Yr. Qpre = 0.11 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.13</td>
<td>0.45</td>
<td>0.18</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.16</td>
<td>0.55</td>
<td>0.52</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.29</td>
<td>1.00</td>
<td>0.70</td>
</tr>
</tbody>
</table>

0.70 = Composite C

*roadway 6852 sq.ft. measured on CAD file

Overland Flow distance (L) = 247 ft
Elevation change = 95 ft
Overland Flow slope (s) = 0.38

Tc = 10.87 min. 652 sec.

100-Yr. I (in/hr) = 3.15 in/hr
(from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.63 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.70
Post-Dev Area = 0.29 acres
Outflow Index = 0.43
Critical Storm Duration (D) = 44 min 2640 sec
Critical Storm Intensity = 1.4 in/hr
Critical Peak Flow (Qp) = 0.28 cfs

Required Detention = (From equation 3 - Aron and Kibler 1990)
Pond Volume = 457 ft^3
Vp = (Qp*D) - Qo*(D+Tc)/2

(Chart K, Zone A based on Tc - from Marin County Ration Method)
(Rd,10 from Chart K, Zone A - from Marin County Ration Method)
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area = 0.24 acres</th>
<th>10580 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value = 0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 311 ft
Elevation change = 105 ft
Overland Flow slope (s) = 0.34

Tc(watershed) = 11.88 min. 713 sec.

100-Yr. I (in/hr) = 3.00 in/hr
10-Yr. I (in/hr) = 1.92 in/hr

100-Yr. Qpre = 0.29 cfs
10-Yr. Qpre = 0.19 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Pervious</th>
<th>Area = 0.72 acres</th>
<th>31498 sq.ft.</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious*</td>
<td>0.19 acres</td>
<td>8123 sq.ft.</td>
<td>0.21</td>
<td>0.95</td>
<td>0.19</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.91 acres</td>
<td>39621 sq.ft.</td>
<td>0.79</td>
<td>0.4</td>
<td>0.32</td>
</tr>
</tbody>
</table>

0.51 = Composite C
*roadway/driveway 4143 sq.ft. measured on CAD file, Lot 23 footprint 2780 sq.ft. measured on CAD file
+ patio assumption for of 1200 sq.ft. from Drainage Report

Overland Flow distance (L) = 311 ft
Elevation change = 105 ft
Overland Flow slope (s) = 0.34

Tc = 11.88 min. 713 sec.

100-Yr. I (in/hr) = 3.00 in/hr

100-Yr. Qpost = 1.40 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.51
Post-Dev Area = 0.91 acres
Outflow Index = 0.31
Critical Storm Duration (D) = 54 min
Critical Storm Intensity = 1.25 in/hr
Critical Peak Flow (Qp) = 0.58 cfs

Required Detention

Pond Volume = 1313 ft^3
Vp = (Qp*D) - Qo*(D+Tc)/2
Pre-development Peak Flow Rate

Area = 0.45 acres 19754 sq.ft.
C value = 0.4

Overland Flow distance (L) = 599 ft
Elevation change = 240 ft
Overland Flow slope (s) = 0.40

Tc(watershed) = 14.01 min. 841 sec.

100-Yr. I (in/hr) = 2.72 in/hr
10-Yr. I (in/hr) = 1.74 in/hr

100-Yr. Qpre = 0.49 cfs
10-Yr. Qpre = 0.32 cfs

Post-development Peak Flow Rate

Pervious
Area = 1.10 acres 47997 sq.ft.
C value = 0.94
Weighted C = 0.38

Impervious*
Area = 0.07 acres 3025 sq.ft.
C value = 0.95
Weighted C = 0.06

Area Total = 1.17 acres 51022 sq.ft.

Composite C = 0.43

*roadway/driveway 3025 sq.ft. measured on CAD file

Overland Flow distance (L) = 599 ft
Elevation change = 240 ft
Overland Flow slope (s) = 0.40

Tc = 14.01 min. 841 sec.

100-Yr. I (in/hr) = 2.72 in/hr

100-Yr. Qpost = 1.38 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.43
Post-Dev Area = 1.17 acres
Outflow Index = 0.49
Critical Storm Duration (D) = 38 min 2280 sec
Critical Storm Intensity = 1.6 in/hr
Critical Peak Flow (Qp) = 0.81 cfs

Required Detention
Pond Volume = 1079 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2

(From Aro and Kibler 1990)

(From equation 3 - Aron and Kibler 1990)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.51 acres</th>
<th>22337 sq.ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 506 ft
Elevation change = 225 ft
Overland Flow slope (s) = 0.44

Tc(watershed) = 13.00 min. 780 sec.

100-Yr. I (in/hr) = 2.85 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 1.83 in/hr 0.641 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.58 cfs
10-Yr. Qpre = 0.37 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.94 acres</td>
<td>0.85</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.17 acres</td>
<td>0.15</td>
<td>0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>1.11 acres</td>
<td>1.11</td>
<td>48480 sq.ft.</td>
</tr>
</tbody>
</table>

0.48 = Composite C

*roadway/driveway 2862 sq.ft. measured on CAD file, Lot 21 footprint 3350 sq.ft. measured on CAD file
+ patio assumption for of 1200sq.ft. from Drainage Report

Overland Flow distance (L) = 506 ft
Elevation change = 225 ft
Overland Flow slope (s) = 0.44

Tc = 13.00 min. 780 sec.

100-Yr. I (in/hr) = 2.85 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 1.54 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.48
Post-Dev Area = 1.11 acres
Outflow Index = 0.54 (From Aron = Qo/(2*C*A) Qo = Pre-development peak flow
Critical Storm Duration (D) = 35 min 2100 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.7 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.92 cfs

Required Detention
Pond Volume = 1082 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
D-23A Design Drainage Basin (Per Land Development Solutions, Drainage Report January 29, 2009)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>1.23 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>528 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>104 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.20</td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>15.72 min.</td>
</tr>
</tbody>
</table>

**100-Yr.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (in/hr)</td>
<td>2.55 in/hr</td>
</tr>
</tbody>
</table>

**10-Yr.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (in/hr)</td>
<td>1.64 in/hr</td>
</tr>
</tbody>
</table>

100-Yr. Qpre = 1.25 cfs

10-Yr. Qpre = 0.80 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Type</th>
<th>Area</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>1.11 acres</td>
<td>0.86</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.18 acres</td>
<td>0.14</td>
<td>0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>1.28 acres</td>
<td>0.14</td>
<td>0.13</td>
</tr>
</tbody>
</table>

0.48 = Composite C

*roadway 7655 sq.ft. measured on CAD file

Overland Flow distance (L) = 315 ft
Elevation change = 80 ft
Overland Flow slope (s) = 0.25
Tc = 12.61 min. 756 sec.

**100-Yr.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (in/hr)</td>
<td>2.90 in/hr</td>
</tr>
</tbody>
</table>

Required Detention

Pond Volume = 766 ft^3

Detention Basin Sizing

Post-Dev Composite C = 0.48
Post-Dev Area = 1.28 acres
Outflow Index = 1.03
Critical Storm Duration (D) = 23 min 1380 sec
Critical Storm Intensity = 2.5 in/hr
Critical Peak Flow (Qp) = 1.52 cfs

Required Detention

Pond Volume = 766 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2

From equation 3 - Aron and Kibler 1990

### Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>1.18 acres</th>
<th>51577 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 493 ft  
Elevation change = 184 ft  
Overland Flow slope (s) = 0.37  

Tc(watershed) = 13.37 min. 802 sec.  

<table>
<thead>
<tr>
<th></th>
<th>100-Yr.</th>
<th>10-Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (in/hr)</td>
<td>2.80 in/hr</td>
<td>1.79 in/hr</td>
</tr>
</tbody>
</table>

100-Yr. I (in/hr) = 2.80 in/hr  
(Chart K, Zone A based on Tc - from Marin County Ration Method)  
10-Yr. I (in/hr) = 1.79 in/hr  
0.641 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)  

100-Yr. Qpre = 1.33 cfs  
10-Yr. Qpre = 0.85 cfs

### Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Pervious</th>
<th>1.18 acres</th>
<th>51577 sq.ft.</th>
<th>0.79</th>
<th>0.4</th>
<th>0.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious*</td>
<td>0.32 acres</td>
<td>13724 sq.ft.</td>
<td>0.21</td>
<td>0.95</td>
<td>0.20</td>
</tr>
<tr>
<td>Area Total</td>
<td>1.50 acres</td>
<td>65301 sq.ft.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0.52 = Composite C  
*roadway 13724 sq.ft. measured on CAD file

Overland Flow distance (L) = 493 ft  
Elevation change = 184 ft  
Overland Flow slope (s) = 0.37  

Tc = 13.37 min. 802 sec.  

<table>
<thead>
<tr>
<th></th>
<th>100-Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (in/hr)</td>
<td>2.80 in/hr</td>
</tr>
</tbody>
</table>

100-Yr. I (in/hr) = 2.80 in/hr  
(from Chart K, Zone A based on Tc - from Marin County Ration Method)

### Detention Basin Sizing

Post-Dev Composite C = 0.52  
Post-Dev Area = 1.50 acres  
Outflow Index = 0.86  
Critical Storm Duration (D) = 25 min 1500 sec  
Critical Storm Intensity = 2.2 in/hr  
Critical Peak Flow (Qp) = 1.70 cfs

Required Detention  
Pond Volume = 1024 ft^3  
Vp = (Qp*D) - Qo*(D+Tc)/2
### Watershed Tributary to Keil Pond

<table>
<thead>
<tr>
<th>Description</th>
<th>Area (sqft)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Watershed Area</strong></td>
<td>74.9 acres</td>
</tr>
<tr>
<td><strong>Existing Urbanized from CAD</strong></td>
<td></td>
</tr>
<tr>
<td>Paradise Road</td>
<td>41,040.0 sqft</td>
</tr>
<tr>
<td>Existing Residence</td>
<td>11,402.0 sqft</td>
</tr>
<tr>
<td>Keil Property</td>
<td>153,512.0 sqft</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>205,954.0 sqft</td>
</tr>
<tr>
<td></td>
<td>4.7 acres</td>
</tr>
<tr>
<td><strong>Post-Project Urbanization</strong></td>
<td></td>
</tr>
<tr>
<td>Half of Lot 15</td>
<td>6398.0 sqft</td>
</tr>
<tr>
<td>Lot 14</td>
<td>16738.0 sqft</td>
</tr>
<tr>
<td>Lot 13</td>
<td>11578.0 sqft</td>
</tr>
<tr>
<td>Lot 12</td>
<td>14432.0 sqft</td>
</tr>
<tr>
<td>Lot 11</td>
<td>15742.0 sqft</td>
</tr>
<tr>
<td>Lot 10</td>
<td>15370.0 sqft</td>
</tr>
<tr>
<td>Lot 24</td>
<td></td>
</tr>
<tr>
<td>Lot 43</td>
<td></td>
</tr>
<tr>
<td>Lot 42</td>
<td>93628.0 sqft</td>
</tr>
<tr>
<td>Lot 41</td>
<td></td>
</tr>
<tr>
<td>Lot 40</td>
<td></td>
</tr>
<tr>
<td>Lot 39</td>
<td></td>
</tr>
<tr>
<td>Lot 25</td>
<td>11070.0 sqft</td>
</tr>
<tr>
<td>Lot 26</td>
<td>9086.0 sqft</td>
</tr>
<tr>
<td>Lot 27</td>
<td>8683.0 sqft</td>
</tr>
<tr>
<td>Lot 28</td>
<td>14391.0 sqft</td>
</tr>
<tr>
<td>Lot 29</td>
<td>11718 sqft</td>
</tr>
<tr>
<td>One-third of Lot 30</td>
<td>7037</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>235871.0 sqft</td>
</tr>
<tr>
<td></td>
<td>5.4 acres</td>
</tr>
<tr>
<td><strong>Existing % Urb</strong></td>
<td>6%</td>
</tr>
<tr>
<td><strong>Post-project % Urb</strong></td>
<td>13.5%</td>
</tr>
<tr>
<td>Watershed E</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Total Watershed Area</td>
<td>23.4 acres</td>
</tr>
<tr>
<td>Existing Urbanized from Google Earth</td>
<td>8.1 acres</td>
</tr>
<tr>
<td>Post-Project Urbanization</td>
<td></td>
</tr>
<tr>
<td>Half of Lot 15</td>
<td>6398.0 sqft</td>
</tr>
<tr>
<td>Lot 16</td>
<td>14899.0 sqft</td>
</tr>
<tr>
<td>Lot 17</td>
<td>13517.0 sqft</td>
</tr>
<tr>
<td>Lot 18</td>
<td>18404.0 sqft</td>
</tr>
<tr>
<td>Lot 19</td>
<td>16629.0 sqft</td>
</tr>
<tr>
<td>Lot 21</td>
<td>13741.0 sqft</td>
</tr>
<tr>
<td>Half of Ridge Road</td>
<td>9840.0</td>
</tr>
<tr>
<td>Total</td>
<td>93428.0 sqft</td>
</tr>
<tr>
<td>2.1 acres</td>
<td></td>
</tr>
<tr>
<td>Existing % Urb</td>
<td>35%</td>
</tr>
<tr>
<td>Post-project % Urb</td>
<td>44%</td>
</tr>
</tbody>
</table>
### Watershed C (Tributary to Railroad Marsh)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Watershed Area</td>
<td>7.7 acres</td>
</tr>
<tr>
<td>Existing Urbanized from CAD</td>
<td>0.0 sqft</td>
</tr>
<tr>
<td>Total</td>
<td>0.0 sqft</td>
</tr>
<tr>
<td></td>
<td>0.0 acres</td>
</tr>
<tr>
<td>Post-Project Urbanization</td>
<td></td>
</tr>
<tr>
<td>Lot 7</td>
<td>63717.5 sqft</td>
</tr>
<tr>
<td>Lot 8</td>
<td>sqft</td>
</tr>
<tr>
<td>Lot 9</td>
<td>sqft</td>
</tr>
<tr>
<td>Half of Lot 20</td>
<td>13961 sqft</td>
</tr>
<tr>
<td>Lot 29</td>
<td>sqft</td>
</tr>
<tr>
<td>Lot 35</td>
<td>sqft</td>
</tr>
<tr>
<td>Lot 36</td>
<td>sqft</td>
</tr>
<tr>
<td>Lot 37</td>
<td>sqft</td>
</tr>
<tr>
<td>Lot 38</td>
<td>sqft</td>
</tr>
<tr>
<td>Half of Water Tank Rd</td>
<td>15436.5 sqft</td>
</tr>
<tr>
<td>Total</td>
<td>163311.3 sqft</td>
</tr>
<tr>
<td></td>
<td>3.7 acres</td>
</tr>
<tr>
<td>Existing % Urb</td>
<td>0%</td>
</tr>
<tr>
<td>Post-project % Urb</td>
<td>48.7%</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>--</td>
</tr>
<tr>
<td><em>(Tributary to San Francisco Bay)</em></td>
<td></td>
</tr>
<tr>
<td>Total Watershed Area</td>
<td>25.5 acres</td>
</tr>
<tr>
<td><strong>Existing Urbanized from CAD</strong></td>
<td></td>
</tr>
<tr>
<td>MMWD Water Tank and Road</td>
<td>19,434.7 sqft</td>
</tr>
<tr>
<td>Total</td>
<td>19,434.7 sqft</td>
</tr>
<tr>
<td></td>
<td>0.4 acres</td>
</tr>
<tr>
<td><strong>Post-Project Urbanization</strong></td>
<td></td>
</tr>
<tr>
<td>Half of Lot 30</td>
<td>10662.0 sqft</td>
</tr>
<tr>
<td>Lot 31</td>
<td>11288.7 sqft</td>
</tr>
<tr>
<td>Lot 32</td>
<td>15611.2 sqft</td>
</tr>
<tr>
<td>Lot 33</td>
<td>9502.7 sqft</td>
</tr>
<tr>
<td>Lot 34</td>
<td>9839.8 sqft</td>
</tr>
<tr>
<td>New Water Tank and Road</td>
<td>28621 sqft</td>
</tr>
<tr>
<td>Total</td>
<td>85525.4 sqft</td>
</tr>
<tr>
<td></td>
<td>2.0 acres</td>
</tr>
<tr>
<td><strong>Existing % Urb</strong></td>
<td>1.7%</td>
</tr>
<tr>
<td><strong>Post-project % Urb</strong></td>
<td>9.4%</td>
</tr>
</tbody>
</table>
Clearwater Hydrology (CH), the Easton Point EIR hydrologist, conducted a peer review of the Drainage Report prepared by the applicant's civil engineer. Because the EIR hydrologist did not agree with the chosen runoff coefficients, "C" values, and the detention facility sizing routine presented in the Drainage Report, additional detention sizing calculations were prepared by the EIR hydrologist. This Technical Appendix provides documentation for the detention facility sizes presented in Exhibit 5.5-3 of the Draft EIR.

CH delineated areas discussed in the Drainage Report, or determined the appropriate area that should be delineated, if different from that discussed in the Drainage Report. These delineated areas were used in the detention analysis spreadsheets. When conducting the detention analysis, CH utilized additional impervious lot areas that the Drainage Report stated would drain to a particular detention facility. The detention facility and detention facility outfall locations are shown on Exhibit 5.5-5.

The Modified Rational Method, as described in Pond Sizing for Rational Formula Hydrographs, was used to calculate the required detention volume to store the increase in post-development runoff during the 100-year storm event at each detention facility location (Exhibit 5.5-5). Land Development Solutions states in the Drainage Report that detention outflows will be maintained at the 10-year pre-development level through incorporation of an orifice or weir for metering flows. Outflow control devices will be designed once the dimensions of the detention facilities have been determined during the final project design phase, since outflow control design is directly related to detention facility dimensions.

Due to the layout of the proposed site roadways, artificial watershed concentration points (stormwater outfalls) were created at the outfall associated with each catch basin/detention system. To ensure peak flow rates are not increased at each detention facility outfall, the pre-development peak flow rate was calculated based on the predevelopment watershed area for each outfall location. The post-development peak flow rate was then calculated for the entire area contributing to the outfall location. Each post-development watershed area was larger than the pre-development watershed area due to proposed grading and roadway construction (except for Detention Facility #1 see HYDR-2). The peak flow rates were assessed in the manner described above to account for modifications.

---


2 The detention facility and detention facility outfall locations are in the same locations as presented in the Drainage Report and on the Grading Plan, Master Plan / Precise Development Plan / Tentative Map, Sheets C-1, C-1A and C-1B, Backen Gillam, International Planning Associates, CSW/Stuber-Stroeh, revised January 29, 2009, for the proposed construction access road.

to drainage patterns of the site and ensure that the pre-project discharge to and through the culverts under Paradise Road will remain at pre-project levels, for the post-project 10-year to 100-year design storm.

Attached are spreadsheets documenting the detention facility sizing calculations. See Section 5.5 Hydrology and Water Quality of the Draft EIR for a further discussion regarding peak flow calculations and detention facility sizing.
Lot 23 (Per Land Development Solutions, Drainage Report January 29, 2009)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.13 acres</th>
<th>5786 sq.ft.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>5.00 min.</td>
<td>300 sec.</td>
</tr>
</tbody>
</table>

100-Yr. I (in/hr) = 4.85 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 3.04 in/hr (from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.26 cfs
10-Yr. Qpre = 0.16 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Post-project Impervious</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 23 footprint</td>
<td>4800 sq.ft. From Tiburon LDA Lot Data</td>
</tr>
<tr>
<td>Lot 23 driveway</td>
<td>986 sq.ft. Measured in AutoCAD</td>
</tr>
<tr>
<td>Total</td>
<td>5786 sq.ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.00 acres</td>
<td>0 sq.ft.</td>
<td>0.00 0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.13 acres</td>
<td>5786 sq.ft.</td>
<td>1.00 0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.13 acres</td>
<td>5786 sq.ft.</td>
<td>0.95</td>
</tr>
</tbody>
</table>

0.95 = Composite C

*all pre-development pervious assumed to be converted to impervious

Tc = 5.00 min. 300 sec.

100-Yr. I (in/hr) = 4.85 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.61 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.95
Post-Dev Area = 0.13 acres
Outflow Index = 1.02

Critical Storm Duration (D) = 23 min 1380 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 2.33 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.29 cfs

Required Detention
Pond Volume = 189 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2

(From Aron and Kibler 1990)
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.72 acres</th>
<th>31244 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value (C)</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>467 ft</td>
<td></td>
</tr>
<tr>
<td>Elevation change</td>
<td>80 ft</td>
<td></td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>(T_c) (watershed)</td>
<td>15.56 min.</td>
<td>934 sec.</td>
</tr>
</tbody>
</table>

\[100-Yr. \text{ I (in/hr)} = 2.50 \text{ in/hr} \]
\[10-Yr. \text{ I (in/hr)} = 1.81 \text{ in/hr} \]

\[Q_{pre} = 0.72 \text{ cfs} \]
\[Q_{pre} = 0.46 \text{ cfs} \]

Post-development Peak Flow Rate

Post-Project Impervious Lot 4 driveway

\| Area                | 3818.56 sq.ft. |
\|---------------------|----------------|
\| Pervious*           | 0.99 acres     |
\| Impervious*         | 0.09 acres     |
\| Area Total          | 0.49 acres     |

\[C = 0.50 \text{ Composite } C\]

| Overland Flow distance (L) | 110 ft      |
| Elevation change           | 14 ft       |
| Overland Flow slope (s)    | 0.02        |
| \(T_t\)                    | 15.49 min.  |
| \(V\)                      | 4.91        |
| \(T_t\)                    | 0.24 min    |

Pipe Flow distance (L) = 128 ft

\[V^* = 22.24 \text{ ft/sec} \]
\[T_t = 0.10 \text{ min} \]

\[Q_{post} = 0.82 \text{ cfs} \]

Due to the reduced watershed area contributing to the Point of Concentration under design conditions, Pre-development peak flow rates are greater than Post-development peak flow rates, thus no detention is required.

Detention Basin Sizing

\[P_{post} = 0.82 \text{ cfs} \]

<table>
<thead>
<tr>
<th>Post-Dev Composite C</th>
<th>0.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Area</td>
<td>0.49 acres</td>
</tr>
<tr>
<td>Outflow Index</td>
<td>1.46</td>
</tr>
</tbody>
</table>

\[\text{Critical Storm Duration (D)} = 15 \text{ min} \]
\[\text{Critical Storm Intensity} = 1.95 \text{ in/hr} \]
\[\text{Critical Peak Flow (Qp)} = 0.48 \text{ cfs} \]

\[V_p = (Q_p D) - Q_o (D + T_c)/2 \]

\[V_p = (0.59 (D/20)^{0.65} S^{0.5} \]

\[Q_o = Q_{pre} \text{ (from Chart K, Zone A based on } T_c \text{ - from Marin County Ration Method)} \]

\[Q_p = Q_{post} \text{ (from equation 3 - Aron and Kibler 1990)} \]

\[\text{Required Detention Volume} = -232 \text{ ft}^3 \]
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.25 acres</th>
<th>10915 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>308 ft</td>
<td></td>
</tr>
<tr>
<td>Elevation change</td>
<td>46 ft</td>
<td></td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>13.98 min</td>
<td>838.7593 sec.</td>
</tr>
</tbody>
</table>

| 100-Yr. I (in/hr) | 2.70 in/hr | (Chart K, Zone A based on Tc - from Marin County Ration Method) |
| 10-Yr. I (in/hr)  | 1.73 in/hr | 0.641 (Rd,10 from Chart K, Zone A - from Marin County Ration Method) |

| 100-Yr. Qpre (Qo) | 0.27 cfs    |
| 10-Yr. Qpre       | 0.17 cfs    |

Post-development Peak Flow Rate

| Lot 2 driveway     | 997 sq.ft. |
| Lot 2 patio        | 2003 sq.ft.|
| Lot 3 driveway     | 1348 sq.ft.|
| Roadway            | 5718 sq.ft.|
| Total              | 10065 sq.ft.|

| Area          | 0.32 acres | 13864 sq.ft. |
| C value      | 0.73       | 0.95         |
| Weighted C   | 0.69       |              |
| Composite C  | 0.80       |              |

| Overland Flow distance (L) | 201 ft |
| Elevation change           | 32 ft  |
| Overland Flow slope (s)    | 0.16   |
| Tc(watershed)              | 8.05 min | 483.0228 sec.|

| 100-Yr. I (in/hr) | 3.40 in/hr | (from Chart K, Zone A based on Tc - from Marin County Ration Method) |
| 10-Yr. Qpost      | 0.86 cfs   |

Detention Basin Sizing

| Post-Dev Composite C | 0.80                  |
| Post-Dev Area       | 0.32 acres            |
| Outflow Index       | 0.53                  |
| Critical Storm Duration (D) | 28 min | 1680 sec | (From Aron and Kibler 1990) |
| Critical Storm Intensity | 2 in/hr            |
| Critical Peak Flow (Qp) | 0.51 cfs | |

| Required Detention | 562 ft^3 |
| Pond Volume        |        |

Vp = (Qp*D) - Qo*(D+Tc)/2
### Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>0.26</th>
<th>11448 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

**Overland Flow**
- Distance (L) = 376 ft
- Elevation change = 70 ft
- Slope (s) = 0.19

**Tc (watershed)**: 14.22 min. 853 sec.

**100-Yr.**
- I (in/hr) = 2.70 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)

**10-Yr.**
- I (in/hr) = 1.73 in/hr
- Qpre = 0.28 cfs

**100-Yr.**
- Qpre = 0.18 cfs

### Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Post-project Impervious</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 1 driveway</td>
<td>2015 sq.ft. Measure on AutoCAD, differs from 2400 cited in DR.</td>
</tr>
<tr>
<td>Lot 1 footprint</td>
<td>3800 sq.ft. From Tiburon LDA Lot Data, differs from 3900 sq.ft. used in DR</td>
</tr>
<tr>
<td>Lot 1 patio, etc.</td>
<td>Value used in DR.</td>
</tr>
<tr>
<td>Total</td>
<td>8515 sq.ft.</td>
</tr>
</tbody>
</table>

**Area**: 8515 sq.ft.

<table>
<thead>
<tr>
<th>Pervious Area (acres)</th>
<th>0.56</th>
<th>24184 sq.ft.</th>
<th>0.74</th>
<th>0.4</th>
<th>0.30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious Area (acres)</td>
<td>0.20</td>
<td>8515 sq.ft.</td>
<td>0.26</td>
<td>0.95</td>
<td>0.25</td>
</tr>
</tbody>
</table>

**Total Area**: 0.75 acres 32699 sq.ft.

**Composite C**: 0.54

**Overland Flow**
- Distance (L) = 322 ft
- Elevation change = 70 ft
- Slope (s) = 0.22

**Tt**: 13.10 min. 786 sec.

**Roadway Flow**
- Distance (L) = 73 ft
- Elevation change = 2 ft
- Slope (s) = 0.03

**V** = 4.91

**Tt**: 0.25 min 15 sec.

**Tc**: 13.35 min 801 sec.

**100-Yr.**
- I (in/hr) = 2.90 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)

**100-Yr.**
- Qpost = 1.18 cfs

### Detention Basin Sizing

**Post-Dev Composite C**: 0.54

**Pond Volume**
- Vp = (Qp*D) - Qo*(D+Tc)/2

**Critical Storm Duration (D)**
- 49 min 2940 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)

**Critical Storm Intensity**
- 1.3 in/hr (From Fig 2 - Aron and Kibler 1990)

**Critical Peak Flow (Qp)**
- 0.53 cfs

**Required Detention**
- From equation 3 - Aron and Kibler 1990

**Pond Volume**
- 1028 ft^3
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>2.58 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>617 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>98 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.16</td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>17.45 min. 1047 sec.</td>
</tr>
<tr>
<td>100-Yr. I (in/hr)</td>
<td>2.40 in/hr</td>
</tr>
<tr>
<td>10-Yr. I (in/hr)</td>
<td>1.55 in/hr</td>
</tr>
<tr>
<td>100-Yr. Qpre</td>
<td>2.48 cfs</td>
</tr>
<tr>
<td>10-Yr. Qpre</td>
<td>1.60 cfs</td>
</tr>
</tbody>
</table>

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Post-Project Impervious</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway</td>
<td>23172 sq.ft. Measured on AutoCAD</td>
</tr>
<tr>
<td>Lot 5 footprint</td>
<td>3800 sq.ft. From Tiburon LDA Lot Data</td>
</tr>
<tr>
<td>Lot 5 driveway</td>
<td>400 sq.ft. Measured on AutoCAD</td>
</tr>
<tr>
<td>Lot 5 patio</td>
<td>3400 sq.ft. From 7600 sq.ft. total impervious assumed for Lot 5 in DR.</td>
</tr>
<tr>
<td>Lot 6 footprint</td>
<td>3720 sq.ft. From Tiburon LDA Lot Data</td>
</tr>
<tr>
<td>Lot 6 driveway</td>
<td>656 sq.ft. Measured on AutoCAD</td>
</tr>
<tr>
<td>Lot 6 patio</td>
<td>4924 sq.ft. From 9300 sq.ft. total impervious assumed for Lot 6 in DR.</td>
</tr>
<tr>
<td>Lot 7 footprint</td>
<td>2052 sq.ft. Only a portion of Lot 7's footprint drains to D-5a. As per sheet G-7</td>
</tr>
<tr>
<td>Lot 7 patio</td>
<td>1600 sq.ft. As assumed in DR</td>
</tr>
<tr>
<td>Total</td>
<td>42124 sq.ft. This was measured in AutoCAD and proportioned to the max footprint.</td>
</tr>
<tr>
<td>Pervious</td>
<td>2.71 acres 118167 sq.ft. 0.74 0.4 0.29</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.97 acres 42124 sq.ft. 0.26 0.95 0.25</td>
</tr>
<tr>
<td>Area Total</td>
<td>3.68 acres 160291 sq.ft.</td>
</tr>
</tbody>
</table>

\[ 0.54 = \text{Composite } C \]

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Flow distance (L)</td>
<td>364 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>0.02 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.10</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.10</td>
</tr>
<tr>
<td>V =</td>
<td>4.01 ft/sec</td>
</tr>
<tr>
<td>Tt =</td>
<td>1.51 min 91 sec.</td>
</tr>
<tr>
<td>Assumed flow depth of 4 in., 0.5ft flat section and then slope so area of flow is 2 ft. wide at surface</td>
<td></td>
</tr>
<tr>
<td>Pipe Flow distance (L)</td>
<td>603 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>58 ft</td>
</tr>
<tr>
<td>V** =</td>
<td>16.63 ft/sec</td>
</tr>
<tr>
<td>*Assumed consistent slope to outfall since I do not have info on pipe slope</td>
<td></td>
</tr>
<tr>
<td>Tt =</td>
<td>0.60 min 36 sec.</td>
</tr>
<tr>
<td>V = (0.59/n)*D^(2/3)*S^0.5</td>
<td></td>
</tr>
<tr>
<td>Tc =</td>
<td>2.12 min 127 sec.</td>
</tr>
<tr>
<td>100-Yr. I (in/hr)</td>
<td>4.85 in/hr</td>
</tr>
<tr>
<td>100-Yr. Qpost</td>
<td>9.72 cfs</td>
</tr>
</tbody>
</table>

Detention Basin Sizing

Post-Dev Composite C | 0.54 |
Post-Dev Area | 3.68 acres |
Outflow Index | 0.62 |
Critical Storm Duration (D) | 31 min 1860 sec |
Critical Storm Intensity | 1.95 in/hr |
Critical Peak Flow (Qp) | 3.91 cfs |

\[ \text{Required Detention} = \frac{Qp \times D}{V_p} \times \frac{1}{2} \times (D+Tc) \]

Pond Volume | 4806 ft³

Pre-development Peak Flow Rate

Area = 1.77 acres 77099 sq.ft.  
C value = 0.4  

Overland Flow distance (L) = 493 ft  
Elevation change = 102 ft  
Overland Flow slope (s) = 0.21  
Tc(watershed) 15.19 min. 911 sec.  

100-Yr. I (in/hr) = 2.60 in/hr  
10-Yr. I (in/hr) = 1.67 in/hr  
0.6425 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)  

100-Yr. Qpre = 1.84 cfs  
10-Yr. Qpre = 1.18 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Post-Project Impervious</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 7</td>
<td>6700 sq.ft. As assumed in DR.</td>
</tr>
<tr>
<td>Lot 8 Footprint</td>
<td>3730 sq.ft. From Tiburon LDA Lot Data</td>
</tr>
<tr>
<td>Lot 8 Patio</td>
<td>1200 sq.ft.</td>
</tr>
<tr>
<td>Shared driveway</td>
<td>4664 sq.ft. Measured in AutoCAD</td>
</tr>
<tr>
<td>Upper Roadway</td>
<td>10300 sq.ft. Measured in AutoCAD</td>
</tr>
<tr>
<td>Raised Water Tank</td>
<td>6418 sq.ft. Measured in AutoCAD</td>
</tr>
<tr>
<td>Total</td>
<td>42012 sq.ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>2.59 acres 112672 sq.ft.</td>
<td>0.73</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.96 acres 42012 sq.ft.</td>
<td>0.27</td>
<td>0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>3.55 acres 154684 sq.ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0.55 = Composite C

Roadway Flow distance (L) = 655 ft  
Elevation change = ft  
Overland Flow slope (s) = 0.01  
V = 2.83  
Tt = 3.85 min 231 sec. used Manning's to approximate velocity of flow in gutter  
area of flow is 2 ft. wide at surface

Roadway Flow distance (L) = 275 ft  
Elevation change = ft  
Overland Flow slope (s) = 0.12  
V = 9.98  
Tt = 0.46 min 28 sec. assumed flow depth of 4 in., 0.5ft flat section and then slope so area of flow is 2 ft. wide at surface  
used 12% slope for section of steep road leading up to water tank

Pipe Flow distance (L) = 525 ft  
Elevation change = 96 ft  
Overland Flow slope (s) = 0.18  
V** = 22.94 ft/sec  
Tt = 0.38 min 23 sec  
**use Manning's for pipe flow from Hydraulics 1949 H. King

Tc = 4.69 min 282 sec  
100-Yr. I (in/hr) = 4.85 in/hr  
100-Yr. Qpost = 9.46 cfs  
(from Chart K, Zone A based on Tc - from Marin County Ration Method)

Detention Basin Sizing

Post-Dev Composite C = 0.55  
Post-Dev Area = 3.55 acres  
Outflow Index= 0.47  
Critical Storm Duration (D) = 40 min 2400 sec  
Critical Storm Intensity = 1.6 in/hr  
Critical Peak Flow (Qp) = 3.12 cfs  

Required Detention  
Pond Volume = 5023 ft^3  
Vp = (Qp*D) - Qo*(D+Tc)/2  
(From equation 3 - Aron and Kibler 1990)
Pre-development Peak Flow Rate

Area = 1.77 acres  77099 sq.ft.
C value = 0.4

Overland Flow distance (L) = 493 ft
Elevation change = 102 ft
Overland Flow slope (s) = 0.21

Tc(watershed) = 15.19 min.  911 sec.

100-Yr. I (in/hr) = 2.60 in/hr  (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 1.67 in/hr  0.6425 (RD, 10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 1.84 cfs
10-Yr. Qpre = 1.18 cfs

Post-development Peak Flow Rate

Lot 7 6700 sq.ft. As assumed in DR.
Lot 8 Footprint 3730 sq.ft. From Tiburon LDA Lot Data
Lot 8 Patio 1200 sq.ft.
Shared driveway 4664 sq.ft. Measured in AutoCAD
Upper Roadway 10300 sq.ft. Measured in AutoCAD
Tank Access 8320 sq.ft. Measured in AutoCAD

Total 43914 sq.ft.

Pervious 2.57 acres 111951 sq.ft. 0.72 0.4 0.29
Impervious* 1.01 acres 43914 sq.ft. 0.28 0.95 0.27
Area Total 3.58 acres 155865 sq.ft.

0.55 = Composite C

Tc = 15.19 min.  911 sec.

100-Yr. I (in/hr) = 4.85 in/hr  (from Chart K, Zone A based on Tc - from Marin County Ration Method)
100-Yr. Qpost = 9.63 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.55
Post-Dev Area = 3.58 acres
Outflow Index= 0.46  (From Aron = Qo/(2*C*A)  Qo = Pre-development peak flow
Critical Storm Duration (D) = 40 min  2400 sec  (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.6 in/hr  (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 3.18 cfs

Required Detention

Vp = (Qp*D) - Qo*(D+Tc)/2

D-6A Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

Area = 0.03 acres 1122 sq.ft.  
C value = 0.4

Overland Flow distance (L) = 105 ft  
Elevation change = 35 ft  
Overland Flow slope (s) = 0.33

Tc(watershed) = 9.01 min. 541 sec.

100-Yr.  I (in/hr) = 3.50 in/hr  
10-Yr.  I (in/hr) = 2.22 in/hr

100-Yr.  Qpre = 0.04 cfs  
10-Yr.  Qpre = 0.02 cfs

Post-development Peak Flow Rate

Area  % Total  C value  Weighted C
Pervious  0.25 acres 10945 sq.ft.  0.73  0.4  0.29
Impervious*  0.10 acres 4148 sq.ft.  0.27  0.95  0.26
Area Total  0.35 acres 15093 sq.ft.

0.55 = Composite C

*construction road 4148 sq.ft. measured on CAD file

Overland Flow distance (L) = 104 ft  
Elevation change = 35 ft  
Overland Flow slope (s) = 0.34

Tt = 8.98 min. 539 sec.

Roadway Flow distance (L) = 37 ft  
Elevation change = ft  
Overland Flow slope (s) = 0.27

V = 14.73  
Tt = 0.04 min 3 sec.

use Manning's to approximate velocity of flow in gutter  
assumed flow depth of 0.1ft. and road section slope of 0.02

Tc = 9.02 min 541 sec

100-Yr.  I (in/hr) = 3.50 in/hr  
100-Yr.  Qpost = 0.67 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.55  
Post-Dev Area = 0.35 acres

Outflow Index = 0.09  
(Qo = Pre-development peak flow)

Critical Storm Duration (D) = 50 min 5400 sec  
Critical Storm Intensity = 0.9 in/hr

Critical Peak Flow (Qp) = 0.17 cfs

Required Detention  
Vp = (Qp*D) - Qo*(D+Tc)/2

Pond Volume = 821 ft³
D-6B Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area = 0.03 acres 1522 sq.ft.</th>
<th>C value = 0.4</th>
</tr>
</thead>
</table>

Overland Flow distance (L) = 121 ft  
Elevation change = 40 ft  
Overland Flow slope (s) = 0.33  

Tc(watershed) = 9.32 min. 559 sec.  

100-Yr. I (in/hr) = 3.40 in/hr  
10-Yr. I (in/hr) = 2.16 in/hr  

(Chart K, Zone A based on Tc - from Marin County Ration Method)  
(0.636 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.05 cfs  
10-Yr. Qpre = 0.03 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area = 0.09 acres 3823 sq.ft.</th>
<th>C value = 0.70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious* 0.04 acres 1618 sq.ft.</td>
<td>Weighted C = 0.28</td>
</tr>
<tr>
<td>Area Total 0.12 acres 5441 sq.ft.</td>
<td>0.56 = Composite C</td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 121 ft  
Elevation change = 40 ft  
Overland Flow slope (s) = 0.33  

Tc = 9.32 min. 559 sec.  

100-Yr. I (in/hr) = 3.40 in/hr  

(from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.24 cfs

Detention Basin Sizing

<table>
<thead>
<tr>
<th>Post-Dev Composite C = 0.56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Area = 0.12 acres</td>
</tr>
</tbody>
</table>
| Outflow Index # = 0.34  
(From Aron = Qo/(2*C*A)  
Qo = Pre-development peak flow |
| Critical Storm Duration (D) = 54 min 3240 sec  
(From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990) |
| Critical Storm Intensity = 1.25 in/hr  
(From Fig 2 - Aron and Kibler 1990) |
| Critical Peak Flow (Qp) = 0.09 cfs |

Required Detention  
Pond Volume = 195 ft^3  
Vp = (Qp*D) - Qo*(D+Tc)/2
D-6C Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

Area = 0.05 acres 2007 sq.ft.
C value = 0.4

Overland Flow distance (L) = 123 ft
Elevation change = 38 ft
Overland Flow slope (s) = 0.31

\(T_c(\text{watershed})\) = 9.45 min. 567 sec.

100-Yr. \(I\) (in/hr) = 3.40 in/hr
10-Yr. \(I\) (in/hr) = 2.16 in/hr

100-Yr. \(Q_{pre}\) = 0.06 cfs
10-Yr. \(Q_{pre}\) = 0.04 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.14 acres</td>
<td>5993 sq.ft.</td>
<td>0.70</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.06 acres</td>
<td>2629 sq.ft.</td>
<td>0.30</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.20 acres</td>
<td>8622 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

\(C = 0.28\) Composite C

*:construction road 2629 sq.ft. measured on CAD file

Overland Flow distance (L) = 114 ft
Elevation change = 30 ft
Overland Flow slope (s) = 0.26

\(T_t\) = 9.52 min. 571 sec.

Roadway Flow distance (L) = ft
Elevation change = ft minimal time on road
Overland Flow slope (s) = ignore

\(V\) = 0.00
\(T_t\) = 0.00 min 0 sec. assumed flow depth of 0.1ft. and road section slope of 0.02

\(T_c\) = 9.52 min 571 sec

100-Yr. \(I\) (in/hr) = 3.40 in/hr
100-Yr. \(Q_{post}\) = 0.38 cfs

Detention Basin Sizing

<table>
<thead>
<tr>
<th>Post-Dev Composite C</th>
<th>0.57</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Area</td>
<td>0.20 acres</td>
</tr>
<tr>
<td>Outflow Index</td>
<td>0.28</td>
</tr>
<tr>
<td>Critical Storm Duration (D)</td>
<td>57 min 3420 sec</td>
</tr>
<tr>
<td>Critical Storm Intensity</td>
<td>1.2 in/hr</td>
</tr>
<tr>
<td>Critical Peak Flow (Qp)</td>
<td>0.13 cfs</td>
</tr>
</tbody>
</table>

\[
\text{Required Detention} = \frac{(D \times Q_p)}{2} - \frac{Q_o(2C^2A)}{2}
\]

\[
Pond Volume = 336 \text{ ft}^3
\]

\[
V_p = (Q_p^*(D)) - Q_o^*(D^2)+Tc/2
\]
D-6D Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.04 acres</th>
<th>1747 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 168 ft
Elevation change = 42 ft
Overland Flow slope (s) = 0.25

Tc (watershed) = 10.59 min. 635 sec.

100-Yr. I (in/hr) = 3.20 in/hr  (Chart K, Zone A based on Tc - from Marin County Rational Method)
10-Yr. I (in/hr) = 2.04 in/hr  0.637  (Rd,10 from Chart K, Zone A - from Marin County Rational Method)

100-Yr. Q_{pre} = 0.05 cfs
10-Yr. Q_{pre} = 0.03 cfs

---

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.16 acres</td>
<td>6859 sq.ft.</td>
<td>0.69</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.07 acres</td>
<td>3038 sq.ft.</td>
<td>0.31</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.23 acres</td>
<td>9897 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

0.57 = Composite C

*construction road 3038 sq.ft. measured on CAD file

Overland Flow distance (L) = 169 ft
Elevation change = 45 ft
Overland Flow slope (s) = 0.27

Tt = 10.49 min. 629 sec.

Roadway Flow distance (L) = 159 ft
Elevation change = 40 ft
Overland Flow slope (s) = 0.25

V = 14.21

use Manning's to approximate velocity of flow in gutter

Tt = 0.19 min 11 sec. assumed flow depth of 0.1 ft. and road section slope of 0.02

Tc = 10.67 min 640 sec

100-Yr. I (in/hr) = 3.20 in/hr  (from Chart K, Zone A based on Tc - from Marin County Rational Method)
100-Yr. Q_{post} = 0.41 cfs

---

Detention Basin Sizing

Post-Dev Composite C = 0.57
Post-Dev Area = 0.23 acres
Outflow Index = 0.20  (From Aron = Qo/(2*C*A)
Critical Storm Duration (D) = 72 min 4320 sec  (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1 in/hr  (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.13 cfs

Required Detention = (From equation 3 - Aron and Kibler 1990)

Pond Volume = 431 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
D-6E Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

\[
\begin{array}{c|c|c}
\text{Area} & 0.02 \text{ acres} & 1071 \text{ sq.ft.} \\
\text{C value} & 0.4 \\
\hline
\text{Overland Flow distance (L)} & 91 \text{ ft} \\
\text{Elevation change} & 40 \text{ ft} \\
\text{Overland Flow slope (s)} & 0.44 \\
\hline
\end{array}
\]

\[ T_c(\text{watershed}) = 8.41 \text{ min.} \quad 504 \text{ sec.} \]

\[
\begin{array}{c|c|c|c|c}
\text{100-Yr. I (in/hr)} & 3.65 \text{ in/hr} & \text{(Chart K, Zone A based on } T_c \text{ - from Marin County Ration Method)} \\
\text{10-Yr. I (in/hr)} & 2.32 \text{ in/hr} & 0.6345 \quad \text{(Rd,10 from Chart K, Zone A - from Marin County Ration Method)} \\
\hline
\text{100-Yr. } Q_{pre} & 0.04 \text{ cfs} \\
\text{10-Yr. } Q_{pre} & 0.02 \text{ cfs} \\
\end{array}
\]

Post-development Peak Flow Rate

\[
\begin{array}{c|c|c|c|c|c}
\text{Area} & \% \text{Total} & \text{C value} & \text{Weighted C} \\
\hline
\text{Pervious} & 0.08 \text{ acres} & 3315 \text{ sq.ft.} & 0.60 & 0.4 & 0.24 \\
\text{Impervious*} & 0.05 \text{ acres} & 2220 \text{ sq.ft.} & 0.40 & 0.95 & 0.38 \\
\text{Area Total} & 0.13 \text{ acres} & 5535 \text{ sq.ft.} & & & 0.62 = \text{Composite C} \\
\hline
\end{array}
\]

\*construction road 2220 sq.ft. measured on CAD file

\[
\begin{array}{c|c|c|c|c|c}
\text{Overland Flow distance (L)} & 93 \text{ ft} \\
\text{Elevation change} & 38 \text{ ft} \\
\text{Overland Flow slope (s)} & 0.41 \\
\hline
\text{Tt} & 8.53 \text{ min.} \quad 512 \text{ sec.} \\
\hline
\text{Roadway Flow distance (L)} & \text{ft} \\
\text{Elevation change} & \text{ft} \quad \text{minimal time on road} \\
\text{Overland Flow slope (s)} & \text{ignore} \\
\hline
\text{V} & 0.00 & \text{use Manning's to approximate velocity of flow in gutter} \\
\text{Tt} & 0.00 \text{ min} \quad 0 \text{ sec.} & \text{assumed flow depth of 0.1ft. and road section slope of 0.02} \\
\hline
\text{Tc} & 8.53 \text{ min} \quad 512 \text{ sec.} \\
\hline
\text{100-Yr. I (in/hr)} & 3.60 \text{ in/hr} & \text{(from Chart K, Zone A based on } T_c \text{ - from Marin County Ration Method)} \\
\text{100-Yr. } Q_{post} & 0.28 \text{ cfs} \\
\end{array}
\]

Detention Basin Sizing

\[
\begin{array}{c|c|c|c|c}
\text{Post-Dev Composite C} & 0.62 \\
\text{Post-Dev Area} & 0.13 \text{ acres} \\
\text{Outflow Index} & 0.23 & \text{(From Aron = } Q_o/(2*C*A) \text{)} \\
\text{Critical Storm Duration (D)} & 44 \text{ min} \quad 2640 \text{ sec} & \text{(From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)} \\
\text{Critical Storm Intensity} & 1.5 \text{ in/hr} & \text{(From Fig 2 - Aron and Kibler 1990)} \\
\text{Critical Peak Flow (Qp)} & 0.12 \text{ cfs} & \text{(From equation 3 - Aron and Kibler 1990)} \\
\text{Required Detention} & \text{Pond Volume} = 256 \text{ ft}^3 \\
\text{Pond Volume} & \text{Vp} = (Qp*D) - Qo*(D*Tc)/2 \\
\end{array}
\]
Pre-development Peak Flow Rate

- Area = 0.02 acres 1073 sq.ft.
- C value = 0.4

Overland Flow distance (L) = 87 ft
Elevation change = 32 ft
Overland Flow slope (s) = 0.37

Tc(watershed) = 8.53 min. 512 sec.

100-Yr. I (in/hr) = 3.60 in/hr  
10-Yr. I (in/hr) = 2.29 in/hr

100-Yr. Qpre = 0.04 cfs
10-Yr. Qpre = 0.02 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Type</th>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.08 acres</td>
<td>0.81</td>
<td>0.4</td>
<td>0.33</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.02 acres 767 sq.ft.</td>
<td>0.19</td>
<td>0.95</td>
<td>0.18</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.09 acres 4122 sq.ft.</td>
<td></td>
<td></td>
<td>0.50 = Composite C</td>
</tr>
</tbody>
</table>

*construction road 767 sq.ft. measured on CAD file

Overland Flow distance (L) = 121 ft
Elevation change = 38 ft
Overland Flow slope (s) = 0.31

Tt = 9.39 min. 564 sec.

Roadway Flow distance (L) = ft
Elevation change = minimal time on road
Overland Flow slope (s) = ignore

V = 0.00
Ti = 0.00 min 0 sec

Tc = 9.39 min. 564 sec

100-Yr. I (in/hr) = 3.45 in/hr  
10-Yr. I (in/hr) = 2.29 in/hr

100-Yr. Qpost = 0.16 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.50
Post-Dev Area = 0.09 acres
Outflow Index = 0.37
Critical Storm Duration (D) = 49 min 2940 sec
Critical Storm Intensity = 1.33 in/hr
Critical Peak Flow (Qp) = 0.06 cfs

Required Detention

Pond Volume = 124 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2

(From equation 3 - Aron and Kibler 1990)
D-6G Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>0.08 acres 3561 sq.ft.</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>214 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>75 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.35</td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>10.63 min. 638 sec.</td>
</tr>
<tr>
<td>100-Yr. I (in/hr)</td>
<td>3.20 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)</td>
</tr>
<tr>
<td>10-Yr. I (in/hr)</td>
<td>2.04 in/hr 0.637 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)</td>
</tr>
<tr>
<td>100-Yr. Qpre</td>
<td>0.10 cfs</td>
</tr>
<tr>
<td>10-Yr. Qpre</td>
<td>0.07 cfs</td>
</tr>
</tbody>
</table>

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious Area</td>
<td>0.18 acres 7696 sq.ft.</td>
</tr>
<tr>
<td>C value</td>
<td>0.74</td>
</tr>
<tr>
<td>Weighted C</td>
<td>0.30</td>
</tr>
<tr>
<td>Impervious Area</td>
<td>0.06 acres 2661 sq.ft.</td>
</tr>
<tr>
<td>C value</td>
<td>0.26</td>
</tr>
<tr>
<td>Weighted C</td>
<td>0.24</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.24 acres 10357 sq.ft.</td>
</tr>
<tr>
<td>Composite C</td>
<td>0.54</td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 136 ft  
Elevation change = 45 ft  
Overland Flow slope (s) = 0.33  
Tc = 9.58 min. 575 sec.  
100-Yr. I (in/hr) = 3.45 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)  
100-Yr. Qpost = 0.44 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.54  
Post-Dev Area = 0.24 acres  
Outflow Index = 0.41  
Critical Storm Duration (D) = 35 min 2100 sec  
Critical Storm Intensity = 1.65 in/hr  
Critical Peak Flow (Qp) = 0.21 cfs

Required Detention

Pond Volume = 306 ft³  
Vp = (Qp*D) - Qo*(D+Tc)/2
D-6H Design Drainage Basin (As labeled by Clearwater Hydrology along Construction Road)

Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.12 acres</th>
<th>5127 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>260 ft</td>
<td></td>
</tr>
<tr>
<td>Elevation change</td>
<td>75 ft</td>
<td></td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.29</td>
<td></td>
</tr>
</tbody>
</table>

\[ T_c(\text{watershed}) = 11.62 \text{ min.} 697 \text{ sec.} \]

\[ 100-\text{Yr.} \quad I (\text{in/hr}) = 3.00 \text{ in/hr} \]  
\[ \text{(Chart K, Zone A based on } T_c - \text{ from Marin County Ration Method)} \]

\[ 10-\text{Yr.} \quad I (\text{in/hr}) = 1.91 \text{ in/hr} \]  
\[ \text{0.638 } (R_d, 10 \text{ from Chart K, Zone A - from Marin County Ration Method)} \]

\[ 100-\text{Yr.} \quad Q_{pre} = 0.14 \text{ cfs} \]

\[ 10-\text{Yr.} \quad Q_{pre} = 0.09 \text{ cfs} \]

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.13 acres</td>
<td>5850 sq.ft.</td>
<td>0.65</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.07 acres</td>
<td>3116 sq.ft.</td>
<td>0.35</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.21 acres</td>
<td>8966 sq.ft.</td>
<td>0.59 = Composite C</td>
</tr>
</tbody>
</table>

\[ *\text{construction road 3116 sq.ft. measured on CAD file} \]

| Overland Flow distance (L) | 167 ft | |
| Elevation change | 53 ft | |
| Overland Flow slope (s) | 0.32 | |

\[ T_t = 10.14 \text{ min.} 609 \text{ sec.} \]

\[ \text{Roadway Flow distance (L) = ft Area = 0.4125} \]

\[ \text{Elevation change = ft minimal time on road } P_w = 2.37 \]

\[ \text{Overland Flow slope (s) = ignore} \]

\[ V = 0.00 \quad \text{use Manning's to approximate velocity of flow in gutter} \]

\[ T_t = 0.00 \text{ min} 0 \text{ sec.} \quad \text{assumed flow depth of 0.1ft. and road section slope of 0.02} \]

\[ T_c = 10.14 \text{ min} 609 \text{ sec} \]

\[ 100-\text{Yr.} \quad I (\text{in/hr}) = 3.25 \text{ in/hr} \]  
\[ \text{(from Chart K, Zone A based on } T_c - \text{ from Marin County Ration Method)} \]

\[ 100-\text{Yr.} \quad Q_{post} = 0.40 \text{ cfs} \]

Detention Basin Sizing

\[ \text{Post-Dev Composite C} = 0.59 \]

\[ \text{Post-Dev Area} = 0.21 \text{ acres} \]

\[ \text{Outflow Index} = 0.58 \quad \text{(From } \text{Aron and Kibler 1990)} \]

\[ \text{Critical Storm Duration (D) = 35 min} \quad \text{2100 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)} \]

\[ \text{Critical Storm Intensity} = 1.75 \text{ in/hr} \quad \text{(From Fig 2 - Aron and Kibler 1990)} \]

\[ \text{Critical Peak Flow (Qp) = 0.21 cfs} \]

\[ \text{Required Detention} \]

\[ \text{Pond Volume} = 256 \text{ ft}^3 \]

\[ V_p = (Q_p^c) - Q_o (D + T_c)/2 \]
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.07 acres</th>
<th>2972 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 108 ft
Elevation change = 38 ft
Overland Flow slope (s) = 0.35

Tc(watershed) = 9.00 min. 540 sec.

100-Yr. I (in/hr) = 3.50 in/hr
10-Yr. I (in/hr) = 2.23 in/hr

100-Yr. Qpre = 0.10 cfs
10-Yr. Qpre = 0.06 cfs

100-Yr. I (in/hr) = 3.50 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 2.23 in/hr 0.636 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.12 acres</td>
<td>5221 sq.ft.</td>
<td>0.63</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.07 acres</td>
<td>3011 sq.ft.</td>
<td>0.37</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.19 acres</td>
<td>8232 sq.ft.</td>
<td>0.60 = Composite C</td>
</tr>
</tbody>
</table>

*roadway 3011 sq.ft. measured on CAD file

Overland Flow distance (L) = 63 ft
Elevation change = 21 ft
Overland Flow slope (s) = 0.33

Tt = 8.11 min. 486 sec.

Roadway Flow distance (L) = 73 ft
Elevation change = 14 ft
Overland Flow slope (s) = 0.043

V = 5.88 use Manning's to approximate velocity of flow in gutter
Tt = 0.21 min 12 sec. assumed flow depth of 4 in., 0.5 ft flat section and then slope so area of flow is 2 ft. wide at surface

Pipe Flow distance (L) = 28 ft
Elevation change = 14 ft
Overland Flow slope (s) = 0.50 *

V** = 37.93 ft/sec **use Manning's for pipe flow from Hydraulics 1949 H. King
Tt = 0.01 min 1 sec

Tc = 8.33 min 500 sec

100-Yr. I (in/hr) = 3.60 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 0.41 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.60
Post-Dev Area = 0.19 acres
Outflow Index = 0.42 (From Aron = Qo/(2*D*C^3)) Qo = Pre-development peak flow
Critical Storm Duration (D) = 47 min 2620 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.33 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.15 cfs

Required Detention
Pond Volume = 268 ft^3

Vp = (Qp*D) - Qo(D+Tc)/2
Pre-development Peak Flow Rate

Area = 0.06 acres 2428 sq.ft.
C value = 0.4

Overland Flow distance (L) = 140 ft
Elevation change = 36 ft
Overland Flow slope (s) = 0.26

Tc (watershed) = 10.05 min. 603 sec.

100-Yr. I (in/hr) = 3.30 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 2.10 in/hr 0.637 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.07 cfs
10-Yr. Qpre = 0.05 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.21 acres 9152 sq.ft.</td>
<td>0.78</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.06 acres 2585 sq.ft.</td>
<td>0.22</td>
<td>0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.27 acres 11737 sq.ft.</td>
<td>0.52 = Composite C</td>
<td></td>
</tr>
</tbody>
</table>

*roadway 3672 sq.ft. measured on CAD file

Overland Flow distance (L) = 83 ft
Elevation change = 21 ft
Overland Flow slope (s) = 0.25

Tt = 8.91 min. 535 sec.

Roadway Flow distance (L) = 100 ft
Elevation change = 2 ft
Area = 0.4125

Overland Flow slope (s) = 0.035

V = 5.30
Tt = 0.31 min 19 sec.

Pipe Flow distance (L) = 20 ft
Elevation change = 15 ft
Overland Flow slope (s) = 0.75 *

V** = 46.45 ft/sec
Tt = 0.01 min 0 sec

Tc = 9.23 min 554 sec

100-Yr. I (in/hr) = 3.40 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)
100-Yr. Qpost = 0.48 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.52
Post-Dev Area = 0.27 acres

Outflow Index = 0.26
Critical Storm Duration (D) = 63 min 3780 sec
Critical Storm Intensity = 1.2 in/hr
Critical Peak Flow (Qp) = 0.17 cfs

Required Detention = Vp = (Qp*D) - Qo*(D+Tc)/2

Pond Volume = 477 ft^3
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th></th>
<th>Area</th>
<th></th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.20 acres</td>
<td>8889 sq.ft.</td>
<td>0.46</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.24 acres</td>
<td>10416 sq.ft.</td>
<td>0.54</td>
<td>0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.44 acres</td>
<td>19305 sq.ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 140 ft
Elevation change = 43 ft
Overland Flow slope (s) = 0.31

Tc(watershed) = 9.76 min. 586 sec.

100-Yr. I (in/hr) = 3.35 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 2.13 in/hr 0.636 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.23 cfs
10-Yr. Qpre = 0.14 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th></th>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.20 acres</td>
<td>8889 sq.ft.</td>
<td>0.46</td>
<td>0.4</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.24 acres</td>
<td>10416 sq.ft.</td>
<td>0.54</td>
<td>0.95</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.44 acres</td>
<td>19305 sq.ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*roadway 10,592 sq.ft. measured on CAD file

Overland Flow distance (L) = 140 ft
Elevation change = 43 ft
Overland Flow slope (s) = 0.31

Tc = 9.76 min. 586 sec.

100-Yr. I (in/hr) = 3.35 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)
100-Yr. Qpost = 1.03 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.70
Post-Dev Area = 0.44 acres
Outflow Index = 0.37

Critical Storm Duration (D) = 47 min 2820 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.33 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.41 cfs

Required Detention
Pond Volume = 771 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>2.19 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance</td>
<td>524 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>182 ft</td>
</tr>
<tr>
<td>Overland Flow slope</td>
<td>0.35</td>
</tr>
<tr>
<td>Tc(watershed)</td>
<td>13.84 min.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event</th>
<th>I (in/hr)</th>
<th>Qpre</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Yr.</td>
<td>2.75 in/hr</td>
<td>2.41 cfs</td>
</tr>
<tr>
<td>10-Yr.</td>
<td>1.76 in/hr</td>
<td>1.55 cfs</td>
</tr>
</tbody>
</table>

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 23 footprint</td>
<td>4800 sq.ft.</td>
</tr>
<tr>
<td>Lot 23 driveway</td>
<td>986 sq.ft.</td>
</tr>
<tr>
<td>Lot 23 patio</td>
<td>2614 sq.ft.</td>
</tr>
<tr>
<td>Roadway</td>
<td>1037 sq.ft.</td>
</tr>
<tr>
<td>Total</td>
<td>18773 sq.ft.</td>
</tr>
<tr>
<td>Pervious%</td>
<td>2.20 acres</td>
</tr>
<tr>
<td>Impervious%</td>
<td>0.43 acres</td>
</tr>
<tr>
<td>Area Total</td>
<td>2.63 acres</td>
</tr>
<tr>
<td>% Total C</td>
<td>0.84</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Weighted C</td>
<td>0.33</td>
</tr>
<tr>
<td>Composite C</td>
<td>0.49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overland Flow distance</td>
<td>524 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>182 ft</td>
</tr>
<tr>
<td>Overland Flow slope</td>
<td>0.35</td>
</tr>
<tr>
<td>Tc</td>
<td>13.84 min.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event</th>
<th>I (in/hr)</th>
<th>Qpre</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Yr.</td>
<td>2.75 in/hr</td>
<td>3.55 cfs</td>
</tr>
</tbody>
</table>

Detention Basin Sizing

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Composite C</td>
<td>0.49</td>
</tr>
<tr>
<td>Post-Dev Area</td>
<td>2.63 acres</td>
</tr>
<tr>
<td>Outflow Index</td>
<td>0.94</td>
</tr>
<tr>
<td>Critical Storm Duration (D)</td>
<td>24 min 1440 sec</td>
</tr>
<tr>
<td>Critical Storm Intensity</td>
<td>2.33 in/hr</td>
</tr>
<tr>
<td>Critical Peak Flow (Qp)</td>
<td>3.01 cfs</td>
</tr>
<tr>
<td>Required Detention</td>
<td>1589 ft³</td>
</tr>
</tbody>
</table>

Vp = (Qp*D) - Q0*(D+Tc)/2

(From equation 3 - Aron and Kibler 1990)
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.14 acres</th>
<th>5991 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 247 ft
Elevation change = 95 ft
Overland Flow slope (s) = 0.38

Tc(watershed) = 10.87 min. 652 sec.

100-Yr. I (in/hr) = 3.15 in/hr (Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. I (in/hr) = 2.01 in/hr 0.638 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

100-Yr. Qpre = 0.17 cfs
10-Yr. Qpre = 0.11 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Pervious</th>
<th>0.13 acres</th>
<th>5673 sq.ft.</th>
<th>0.46</th>
<th>0.4</th>
<th>0.18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious*</td>
<td>0.16 acres</td>
<td>6775 sq.ft.</td>
<td>0.54</td>
<td>0.95</td>
<td>0.52</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.29 acres</td>
<td>12448 sq.ft.</td>
<td></td>
<td></td>
<td>0.70</td>
</tr>
</tbody>
</table>

*roadway 6775 sq.ft. measured on CAD file

0.70 = Composite C

Overland Flow distance (L) = 247 ft
Elevation change = 95 ft
Overland Flow slope (s) = 0.38

Tc = 10.87 min. 652 sec.

100-Yr. I (in/hr) = 3.15 in/hr (from Chart K, Zone A based on Tc - from Marin County Ration Method)
10-Yr. Qpre = 0.11 cfs

Detention Basin Sizing

Post-Dev Composite C = 0.70
Post-Dev Area = 0.29 acres

Outflow Index = 0.43 (From Aron = Qo/(2*C*A) Qo = Pre-development peak flow

Critical Storm Duration (D) = 44 min 2640 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
Critical Storm Intensity = 1.4 in/hr (From Fig 2 - Aron and Kibler 1990)
Critical Peak Flow (Qp) = 0.28 cfs

Required Detention
Pond Volume = 453 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
**Pre-development Peak Flow Rate**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>0.24 acres</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>311 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>105 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.34</td>
</tr>
</tbody>
</table>

\[
T_c(watershed) = 11.88 \text{ min. 713 sec.}
\]

<table>
<thead>
<tr>
<th>Event Year</th>
<th>I (in/hr)</th>
<th>Qpre</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Yr.</td>
<td>3.00</td>
<td>0.29 cfs</td>
</tr>
<tr>
<td>10-Yr.</td>
<td>1.92</td>
<td>0.19 cfs</td>
</tr>
</tbody>
</table>

**Post-development Peak Flow Rate**

**Notes**
- Lot 18 footprint 3500 sq.ft. Portion, as assumed in DR
- Lot 21 footprint 3500 sq.ft. From Tiburon LDA Lot Data
- Lot 21 patio 2100 sq.ft. Derived from 5600 sq.ft. Lot 21 impervious assumption in DR
- Roadways 2884 sq.ft. Measured on AutoCAD
- Total 11984 sq.ft.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.43 acres</td>
<td>0.61</td>
<td>0.4</td>
<td>0.24</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.28 acres</td>
<td>0.39</td>
<td>0.95</td>
<td>0.37</td>
</tr>
<tr>
<td>Area Total</td>
<td>0.70 acres</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

\[
0.62 = \text{Composite C}
\]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overland Flow distance (L)</td>
<td>311 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>105 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.34</td>
</tr>
</tbody>
</table>

\[
T_c = 11.88 \text{ min. 713 sec.}
\]

<table>
<thead>
<tr>
<th>Event Year</th>
<th>I (in/hr)</th>
<th>Qpost</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Yr.</td>
<td>3.00</td>
<td>1.30 cfs</td>
</tr>
</tbody>
</table>

**Detention Basin Sizing**

\[
\text{V}_p = \frac{(Q_pD) - Q_o(D+T_c)/2}{(Q_o/2C^A)^2}
\]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Composite C</td>
<td>0.62</td>
</tr>
<tr>
<td>Post-Dev Area</td>
<td>0.70 acres</td>
</tr>
<tr>
<td>Outflow Index</td>
<td>0.34 (From Aron = Q_o(2C^A))</td>
</tr>
<tr>
<td>Critical Storm Duration (D)</td>
<td>54 min 3240 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)</td>
</tr>
<tr>
<td>Critical Storm Intensity</td>
<td>1.25 in/hr</td>
</tr>
<tr>
<td>Critical Peak Flow (Qp)</td>
<td>0.54 cfs</td>
</tr>
</tbody>
</table>

\[
\text{Required Detention} = 1176 \text{ ft}^3
\]
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>0.45 acres</th>
<th>19754 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 599 ft  
Elevation change = 240 ft  
Overland Flow slope (s) = 0.40  

Tc(watershed) = 14.01 min. 841 sec.

100-Yr. I (in/hr) = 2.72 in/hr  
10-Yr. I (in/hr) = 1.74 in/hr  

100-Yr. Qpre = 0.49 cfs  
10-Yr. Qpre = 0.32 cfs

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Lot 18</th>
<th>5000 sq.ft.</th>
<th>Portion of Lot 18 impervious as assumed in DR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 20</td>
<td>7000 sq.ft.</td>
<td>Portion of Lot 20 impervious as assumed in DR</td>
</tr>
<tr>
<td>Roadways</td>
<td>2628 sq.ft.</td>
<td>Measure on AutoCAD</td>
</tr>
<tr>
<td>Total</td>
<td>14628 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>1.13 acres</td>
<td>49258 sq.ft.</td>
<td>0.77</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.34 acres</td>
<td>14628 sq.ft.</td>
<td>0.23</td>
</tr>
<tr>
<td>Area Total</td>
<td>1.47 acres</td>
<td>63886 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

0.53 = Composite C

Overland Flow distance (L) = 599 ft  
Elevation change = 240 ft  
Overland Flow slope (s) = 0.40  

Tc = 14.01 min. 841 sec.

100-Yr. I (in/hr) = 2.72 in/hr  
(Chart K, Zone A based on Tc - from Marin County Ration Method)

100-Yr. Qpost = 2.10 cfs

Detention Basin Sizing

<table>
<thead>
<tr>
<th>Post-Dev Composite C</th>
<th>0.53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Dev Area</td>
<td>1.47 acres</td>
</tr>
</tbody>
</table>

Outflow Index = 0.32  
(From Aron = Qo/(2*C*A)  
Qo = Pre-development peak flow)

Critical Storm Duration (D) = 38 min 2280 sec  
(From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)

Critical Storm Intensity = 1.6 in/hr  
(From Fig 2 - Aron and Kibler 1990)

Critical Peak Flow (Qp) = 1.23 cfs

Required Detention

Pond Volume = 2044 ft^3  
(Vp = (Qp*D) - Qo*(D+Tc)/2)
Pre-development Peak Flow Rate

- Area = 0.51 acres 22337 sq.ft.
- C value = 0.4

- Overland Flow distance (L) = 506 ft
- Elevation change = 225 ft
- Overland Flow slope (s) = 0.44

- \( Tc \) (watershed) = 13.00 min. 780 sec.

- 100-Yr. I (in/hr) = 2.85 in/hr (Chart K, Zone A based on \( Tc \) - from Marin County Ration Method)
- 10-Yr. I (in/hr) = 1.83 in/hr 0.641 (Rd,10 from Chart K, Zone A - from Marin County Ration Method)

- 100-Yr. \( Q_{pre} \) = 0.58 cfs
- 10-Yr. \( Q_{pre} \) = 0.37 cfs

Post-development Peak Flow Rate

Roadways 2192 sq.ft. Measured in AutoCAD
Lot 20 footprint 3200 sq.ft. Portion of Lot 20 impervious as assumed in DR
Total 5392 sq.ft.

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>0.99 acres</td>
<td>43088 sq.ft.</td>
<td>0.89</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.12 acres</td>
<td>5392 sq.ft.</td>
<td>0.11</td>
</tr>
<tr>
<td>Area Total</td>
<td>1.11 acres</td>
<td>48480 sq.ft.</td>
<td></td>
</tr>
</tbody>
</table>

0.46 = Composite C

- Overland Flow distance (L) = 506 ft
- Elevation change = 225 ft
- Overland Flow slope (s) = 0.44

- \( Tc \) = 13.00 min. 780 sec.

- 100-Yr. I (in/hr) = 2.85 in/hr (from Chart K, Zone A based on \( Tc \) - from Marin County Ration Method)

- 100-Yr. \( Q_{post} \) = 1.46 cfs

Detention Basin Sizing

- Post-Dev Composite C = 0.46
- Post-Dev Area = 1.11 acres
- Outflow Index = 0.57 (From Aron = Qo/(2*C*A) Qo = Pre-development peak flow
- Critical Storm Duration (D) = 35 min 2100 sec (From the Critical Duration Curves (Fig 3) - Aron and Kibler 1990)
- Critical Storm Intensity = 1.7 in/hr
- Critical Peak Flow (Qp) = 0.87 cfs

Required Detention

Pond Volume = 991 ft^3 (From equation 3 - Aron and Kibler 1990)
\( V_p = (Qp^2) - Qo^2(Tc+D)/2 \)
### Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (acres)</td>
<td>1.23</td>
</tr>
<tr>
<td>C value</td>
<td>0.4</td>
</tr>
<tr>
<td>Overland Flow distance (L)</td>
<td>528 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>104 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.20</td>
</tr>
<tr>
<td>Tc (watershed)</td>
<td>15.72 min.</td>
</tr>
<tr>
<td></td>
<td>943 sec.</td>
</tr>
</tbody>
</table>

100-Yr. I (in/hr) = 2.55 in/hr  
10-Yr. I (in/hr) = 1.64 in/hr  

100-Yr. Q_{pre} = 1.25 cfs  
10-Yr. Q_{pre} = 0.80 cfs

### Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Type</th>
<th>Area (acres)</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>1.11</td>
<td>0.87</td>
<td>0.35</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.17</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>Total Area</td>
<td>1.28</td>
<td></td>
<td>0.47</td>
</tr>
</tbody>
</table>

*roadway 7518 sq ft. measured on CAD file

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overland Flow distance (L)</td>
<td>315 ft</td>
</tr>
<tr>
<td>Elevation change</td>
<td>80 ft</td>
</tr>
<tr>
<td>Overland Flow slope (s)</td>
<td>0.25</td>
</tr>
<tr>
<td>Tc</td>
<td>12.61 min.</td>
</tr>
<tr>
<td></td>
<td>756 sec.</td>
</tr>
</tbody>
</table>

100-Yr. I (in/hr) = 2.90 in/hr  
100-Yr. Q_{post} = 1.76 cfs

### Detention Basin Sizing

- Post-Dev Composite C = 0.47
- Post-Dev Area = 1.28 acres
- Outflow Index = 1.03
- Critical Storm Duration (D) = 23 min
- Critical Storm Intensity = 2.5 in/hr
- Critical Peak Flow (Qp) = 1.52 cfs

Required Detention

\[ V_p = \frac{(Qp^*D) - Qo^*(D+Tc)/2}{C^*} \]

Pond Volume = 760 ft³
Pre-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>1.18 acres</th>
<th>51577 sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C value</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Overland Flow distance (L) = 493 ft
Elevation change = 184 ft
Overland Flow slope (s) = 0.37

Tc(watershed) = 13.37 min. 802 sec.

| 100-Yr. | I (in/hr) = 2.80 in/hr | (Chart K, Zone A based on Tc - from Marin County Ration Method) |
| 10-Yr. | I (in/hr) = 1.79 in/hr | 0.641 (Rd,10 from Chart K, Zone A - from Marin County Ration Method) |

| 100-Yr. | Qpre = 1.33 cfs |
| 10-Yr. | Qpre = 0.85 cfs |

Post-development Peak Flow Rate

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total</th>
<th>C value</th>
<th>Weighted C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervious</td>
<td>1.18 acres</td>
<td>51577 sq.ft.</td>
<td>0.82</td>
</tr>
<tr>
<td>Impervious*</td>
<td>0.27 acres</td>
<td>11634 sq.ft.</td>
<td>0.18</td>
</tr>
<tr>
<td>Area Total</td>
<td>1.45 acres</td>
<td>63211 sq.ft.</td>
<td>0.50 = Composite C</td>
</tr>
</tbody>
</table>

*roadway 11634 sq.ft. measured on CAD file

Overland Flow distance (L) = 493 ft
Elevation change = 184 ft
Overland Flow slope (s) = 0.37

Tc = 13.37 min. 802 sec.

| 100-Yr. | I (in/hr) = 2.80 in/hr | (from Chart K, Zone A based on Tc - from Marin County Ration Method) |
| 100-Yr. | Qpost = 2.04 cfs |

Detention Basin Sizing

Post-Dev Composite C = 0.50
Post-Dev Area = 1.45 acres

Outflow Index = 0.91
Critical Storm Duration (D) = 25 min 1500 sec
Critical Storm Intensity = 2.2 in/hr
Critical Peak Flow (Qp) = 1.60 cfs

Required Detention
Pond Volume = 874 ft^3

Vp = (Qp*D) - Qo*(D+Tc)/2
<table>
<thead>
<tr>
<th>Watershed Tributary to Keil Pond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Watershed Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Existing Urbanized from CAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradise Road</td>
</tr>
<tr>
<td>Existing Residence</td>
</tr>
<tr>
<td>Keil Property</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-Project Urbanization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half of Lot 13</td>
</tr>
<tr>
<td>Lot 12</td>
</tr>
<tr>
<td>Lot 11</td>
</tr>
<tr>
<td>Lot 10</td>
</tr>
<tr>
<td>Lot 9</td>
</tr>
<tr>
<td>Lot 22</td>
</tr>
<tr>
<td>Lot 23</td>
</tr>
<tr>
<td>Lot 24</td>
</tr>
<tr>
<td>Lot 25</td>
</tr>
<tr>
<td>Lot 26</td>
</tr>
<tr>
<td>One-third of Lot 27</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<p>| Existing % Urb                   | 6% |
| Post-project % Urb               | 10% |</p>
<table>
<thead>
<tr>
<th>Watershed E</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Watershed Area</td>
<td>23.4 acres</td>
</tr>
<tr>
<td>Existing Urbanized from Google Earth</td>
<td>8.1 acres</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-Project Urbanization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Half of Lot 13</td>
<td>6398.0 sqft</td>
</tr>
<tr>
<td>Lot 14</td>
<td>14899.0 sqft</td>
</tr>
<tr>
<td>Lot 15</td>
<td>13517.0 sqft</td>
</tr>
<tr>
<td>Lot 16</td>
<td>18404.0 sqft</td>
</tr>
<tr>
<td>Lot 17</td>
<td>16629.0 sqft</td>
</tr>
<tr>
<td>Lot 19</td>
<td>13741.0 sqft</td>
</tr>
<tr>
<td>Half of Ridge Road</td>
<td>9840.0 sqft</td>
</tr>
<tr>
<td>Total</td>
<td>93428.0 sqft</td>
</tr>
<tr>
<td></td>
<td>2.1 acres</td>
</tr>
<tr>
<td>Existing % Urb</td>
<td>35%</td>
</tr>
<tr>
<td>Post-project % Urb</td>
<td>44%</td>
</tr>
<tr>
<td>Watershed C (Tributary to Railroad Marsh)</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Total Watershed Area</td>
<td>7.7 acres</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing Urbanized from CAD</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>0.0 sqft</td>
</tr>
<tr>
<td>Total</td>
<td>0.0 sqft</td>
</tr>
<tr>
<td></td>
<td>0.0 acres</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Project Urbanization</td>
<td></td>
</tr>
<tr>
<td>Half of Lot 5</td>
<td>13961 sqft</td>
</tr>
<tr>
<td>Lot 7</td>
<td>sqft</td>
</tr>
<tr>
<td>Lot 8</td>
<td>63717.5 sqft</td>
</tr>
<tr>
<td>Lot 9</td>
<td>sqft</td>
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<tr>
<td>Half of Water Tank Rd</td>
<td>15436.5 sqft</td>
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<tr>
<td>Total</td>
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<tr>
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<tr>
<td>Post-project % Urb</td>
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<td>Total Watershed Area</td>
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<tr>
<td>Existing Urbanized from CAD</td>
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</tr>
<tr>
<td>MMWD Water Tank and Road</td>
<td>19,434.7 sqft</td>
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<tr>
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<tr>
<td>0.4 acres</td>
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<td>Half of Lot 27</td>
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<td>15611.2 sqft</td>
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<td>9502.7 sqft</td>
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<td>31</td>
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<td>New Water Tank and Road</td>
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<td>Remainder Lot</td>
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<tr>
<td>Post-project % Urb</td>
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APPENDIX

VASCULAR PLANTS OF THE STUDY AREA

The plant species listed below have been observed on the study area during surveys conducted by Hartesveldt Ecological Consulting Services on May 18, 2000, and by Live Oak Associates on March 19, April 6, May 12, and June 10, 2009. The U.S. Fish and Wildlife Service wetland indicator status of each plant has been shown following its common name.

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<tr>
<th>Family</th>
<th>Common Name</th>
<th>U.S. Fish and Wildlife Service Status</th>
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<tbody>
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<td>Aceraceae – Maple Family</td>
<td>Acacia macrophylla</td>
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<td>Anacardiaceae – Sumac Family</td>
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<td>Apiaceae – Carrot Family</td>
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<td>Daucus pusillus</td>
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<tr>
<td></td>
<td>Foeniculum vulgare</td>
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<td></td>
<td>Lomatium dasyacarpum</td>
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<td>Lomatium utriculatum</td>
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<td>Cirsium occidentale var. venustum</td>
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<td>Cotula coronopifolia</td>
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<td>Erechites glomerata</td>
<td>Cut-leaved Fireweed</td>
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<td>Erechites minimus</td>
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<td>Erigeron karvinskianus</td>
<td>Latin American fleabane</td>
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Eriophyllum confertiflorum  Woolly Sunflower  UPL
Eriophyllum staechadifolium  Lizard Tail  UPL
Filago californica  Herba Impia  UPL
Filago gallica  Narrow-leaved Filago  UPL
Gnaphalium californicum  Cudweed  UPL
Gnaphalium purpureum  Purple Cudweed  UPL
Grindelia hirsutula var. hirsutula  Hairy Gumweed  UPL
Hemizonia congesta ssp. congesta  Yellow Hayfield Tarweed  UPL
Hesperoxa sparsiflora var. sparsiflora  Few-flowered Evax  UPL
Heterotheca sessiliflora ssp. bolanderi  Bolander Goldenaster  UPL
Hieracium albilorum  White-flowered Hawkweed  UPL
Hypochoeris glabra  Smooth Cat’s-ear  UPL
Hypochoeris radicata  Rough Cat’s-ear  UPL
Lactuca saligna  Willow Lettuce  NI
Lasthenia californica  Goldfields  UPL
Layia platyglossa  Tidy Tips  UPL
Mada gracilis  Slender Tarweed  UPL
Microspermum californicum var. californicum  Slender Cottonweed  UPL
Microseris bigelowii  Coastal Silverpuffs  UPL
Microseris douglassii  Douglas Microseris  UPL
Pentachaeta bellidiflora  White-rayed Pentachaeta  UPL
Picris echioides  Bristly Ox-tongue  FAC
Senecio aronicooides  Groundsel  UPL
Senecio mikanioides  German Ivy  UPL
Silybum marianum  Milk Thistle  UPL
Solinia sessilis  Common soliva  FAC
Sonchus oleraceous  Common Sow Thistle  NI
Uropappus lindleyi  Lindley’s Silverpuffs  UPL
Wyethia angustifolia  Narrow-leaf Mule Ears  FACU-

**BETULACEAE – Birch Family**
Corylus cornuta var. californica  Hazelnut  NI

**BORAGINACEAE - Borage Family**
Cryptantha flaccida  White Forget-me-not  UPL
Cynoglossum grande  Hound’s Tongue  UPL
Myosotis discolor  Forget-me-not  NI
Myosotis latifolia  Broadleaf Forget-me-not  UPL
Plagiobothrys sp.  Popcornflower  UPL

**BRASSICACEAE - Mustard Family**
Arabis blepharophylla  Coast Rock Cress  UPL
Cardamine californica var. californica  Milkmaids  UPL
Cardamine oligosperma  Bittercress  FACW
Erysimum sp.  Wallflower  UPL
Guillenia lasiophylla  California Mustard  UPL
Lepidium nitidum var. nitidum  Peppergrass  UPL

**CACTACEAE – Cactus Family**
Opuntia ficus-indica  Mission Cactus  UPL

**CAMPANULACEAE – Bellflower Family**
Dichondra donelliana  California dichondra  UPL

**CAPRIFOLIACEAE – Honeysuckle Family**
Lonicera sp.  Twinberry  UPL
Sambucus mexicana  Blue Elderberry  FAC
Symphoricarpos albus  Snowberry  FACU
Symphoricarpos mollis  Creeping Snowberry  UPL

**CARYOPHYLLACEAE - Pink Family**
Cerastium glomeratum  Mouse-eared Chickweed  UPL
Minuartia douglasii  Douglas Sandwort  UPL
Silene gallica   Windmill Pink    UPL
Spergularia bocconii Boccone’s Sand Spurry    UPL
Stellaria media Common Chickweed    FACU
CONVOLVULACEAE – Morning Glory Family
Calystegia purpurata Morning Glory    UPL
Calystegia sp. Morning Glory    UPL
Convovulus arvensis Field Bindweed    UPL
CRASSULACEAE – Stonecrop Family
Crassula comnata Sand Pygmyweed    FAC
Dudleya cymosa Common Dudley    UPL
Dudleya farinosa Bluff Lettuce    UPL
CUCURBITACEAE – Gourd Family
Marah fabaceus Wild Cucumber    UPL
Marah oreganus Coast Man-root    UPL
CUPRESSACEAE – Cypress Family
Cupressus macrocarpa Monterey Cypress    UPL
CYPERACEAE – Sedge Family
Carex echinata ssp. phyllomanica Foothill Sedge    UPL
Carex tumulicola
Carex eragrostis Flatsedge    FACW
DENNSTAEDTIACEAE – Bracken Family
Pteridium aquilinum var. pubescens Bracken Fern    FACU
DIPSACACEAE – Teasel Family
Dipsacus sp. Teasel    NI
DRYOPTERIDACEAE – Wood Fern Family
Dryopteris arguta Coastal Wood Fern    UPL
Polystichum munitum Western Sword Fern    UPL
EQUISETACEAE – Horsetail Family
Equisetum sp. Horsetail    FACW
ERICACEAE – Heath Family
Arbutus menziesii Pacific Madrone    UPL
Arctostaphylos uva-ursi Bear Berry    UPL
EUPHORBIACEAE – Spurge Family
Euphorbia peplus Petty Spurge    UPL
Euphorbia spathulata Spatulateleaf Spurge
FABACEAE - Pea Family
Acacia longifolia Sydney Golden Wattle    UPL
Astragalus gambiaeanus Gambel’s Milkvetch    UPL
Astragalus jepsonianus Jepson’s Milkvetch    UPL
Genista monspellulana French Broom    UPL
Lathyrus vestitus var. vestitus Common Pacific Pea    UPL
Lotus micranthus Small-flowered Lotus    UPL
Lotus purshianus var. purshianus Spanish Clover    UPL
Lotus wrangelianus California Lotus    UPL
Lupinus bicolor Miniature Lupine    UPL
Lupinus microcarpus Chick Lupine    UPL
Lotus micranthus var. densiflorus Chick Lupine    UPL
Lupinus microcarpus var. microcarpus Chick Lupine    UPL
Lupinus nanus Douglas Lupine    UPL
Medicago lupulina Black medick    FAC
Medicago polymorpha Burclover    UPL
Melilotus indica Sour Clover    FAC
Thermopsis macrophylla False Lupine    UPL
Trifolium alboalbopurpureum Rancheria Clover    UPL
Trifolium depauperatum Sack Clover    FAC
Trifolium dubium Little Hop Clover    FACU
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<td><em>Linum usitatissimum</em></td>
<td>Common Flax</td>
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<td><em>Hesperolinon congestum</em></td>
<td>Marin Dwarf Flax</td>
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<td><em>Hesperolinon disjunctum</em></td>
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<td><em>Linum bienne</em></td>
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<td><em>Linum usitatissimum</em></td>
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<td>LYTHRACEAE – Loosestrife Family</td>
<td><em>Lythrum hyssopifolia</em></td>
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<td>MALVACEAE – Mallow Family</td>
<td><em>Sidalcea malvaeflora ssp. malvaeflora</em></td>
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<td><em>Sidalcea malviflora ssp. laciniata</em></td>
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<td>MORACEAE – Mulberry Family</td>
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<td>MYCOPORACEAE – Myoporum Family</td>
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<td><em>Clarkia rubicunda</em></td>
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<td><em>Epilobium minutum</em></td>
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<td><em>Oxalis incarnate</em></td>
<td>Crimson Woodsoxrel</td>
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<td><em>Oxalis pes-caprae</em></td>
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<td><em>Pinus radicata</em></td>
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<td><em>Avena barbata</em></td>
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<td><em>Cortaderia sellanona</em></td>
<td>Pampas Grass</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Cynosurus echinatus</em></td>
<td>Hedgehog Dog-tail Grass</td>
<td>FACW</td>
<td></td>
</tr>
<tr>
<td><em>Danthonia californica var. californica</em></td>
<td>California Oatgrass</td>
<td>FACW</td>
<td></td>
</tr>
<tr>
<td><em>Ehrharta erecta</em></td>
<td>Erect Veldgrass</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td><em>Elymus glaucus ssp. glaucus</em></td>
<td>Blue Wildrye</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td><em>Elymus multisetus</em></td>
<td>Big Squirreltail</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Festuca californica</em></td>
<td>California Fescue</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td><em>Holcus lanatus</em></td>
<td>Common Veldtgrass</td>
<td>FAC</td>
<td></td>
</tr>
<tr>
<td><em>Hordeum marinum ssp. gussoneanum</em></td>
<td>Mediterranean Barley</td>
<td>FAC</td>
<td></td>
</tr>
<tr>
<td><em>Hordeum marinum ssp. leporinum</em></td>
<td>Barnyard Barley</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td><em>Lolium multiflorum</em></td>
<td>Italian Ryegrass</td>
<td>FAC</td>
<td></td>
</tr>
<tr>
<td><em>Melica californica</em></td>
<td>California Melic Grass</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Melica torreyana</em></td>
<td>Torrey Melic</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Melic sp.</em></td>
<td>Melic Grass</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Nassella lepida</em></td>
<td>Foothill Needlegrass</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Nassella pulchra</em></td>
<td>Purple Needlegrass</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Paspalum dilatatum</em></td>
<td>Dallis Grass</td>
<td>FAC</td>
<td></td>
</tr>
<tr>
<td><em>Poa annua</em></td>
<td>Annual Bluegrass</td>
<td>FACW</td>
<td></td>
</tr>
<tr>
<td><em>Poa secunda ssp. secunda</em></td>
<td>One-sided Bluegrass</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Schismus barbatus</em></td>
<td>Old Han Schmisus</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Vulpia bromoides</em></td>
<td>Six-Weeks Brome Grass</td>
<td>FACW</td>
<td></td>
</tr>
<tr>
<td><em>Vulpia microstachys</em></td>
<td>Annual Fescue</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td><em>Vulpia myuros</em></td>
<td>Rattail Fescue</td>
<td>FACU</td>
<td></td>
</tr>
</tbody>
</table>

**POLEMONIACEAE – Phlox Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Linanthus parviflorus</em></td>
<td>Linanthus</td>
<td>UPL</td>
</tr>
</tbody>
</table>

**POLYGALACEAE – Milkwort Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Polygala californica</em></td>
<td>California Milkwort</td>
<td>UPL</td>
</tr>
</tbody>
</table>

**POLYGONACEAE – Buckwheat Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Chorizanthe polygonoides var. polygonoides</em></td>
<td>Knotweed Spineflower</td>
<td>UPL</td>
</tr>
<tr>
<td><em>Eriogonum latifolium</em></td>
<td>Coast Buckwheat</td>
<td>UPL</td>
</tr>
<tr>
<td><em>Eriogonum nudum var. nudum</em></td>
<td>Buckwheat</td>
<td>UPL</td>
</tr>
<tr>
<td><em>Rumex acetosella</em></td>
<td>Sheep Sorrel</td>
<td>FAC</td>
</tr>
<tr>
<td><em>Rumex crispus</em></td>
<td>Curly Dock</td>
<td>FAC</td>
</tr>
<tr>
<td><em>Rumex pulcher</em></td>
<td>Fiddle Dock</td>
<td>FAC</td>
</tr>
</tbody>
</table>

**POLYPODIACEAE - Polypo dy Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Polypodium californicum</em></td>
<td>California Polypody</td>
<td>UPL</td>
</tr>
<tr>
<td><em>Polypodium hesperium</em></td>
<td>Western Polypody</td>
<td>UPL</td>
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</table>

**PORTULACACEAE – Purslane Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Calandrina ciliata</em></td>
<td>Redmaids</td>
<td>FACU</td>
</tr>
<tr>
<td><em>Claytonia perfoliata ssp. perfoliata</em></td>
<td>Miner’s Lettuce</td>
<td>FAC</td>
</tr>
</tbody>
</table>

**PRIMULACEAE – Primrose Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Anagallis arvensis</em></td>
<td>Scarlet Pimpernel</td>
<td>FAC</td>
</tr>
<tr>
<td><em>Do decatheon hendersonii</em></td>
<td>Mosquito Bills</td>
<td>UPL</td>
</tr>
</tbody>
</table>

**PTERIDACEAE – Brake Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Adiantum jordanii</em></td>
<td>California Maidenhair</td>
<td>UPL</td>
</tr>
<tr>
<td><em>Pellea andromaedi folia</em></td>
<td>Coffee Fern</td>
<td>UPL</td>
</tr>
<tr>
<td><em>Pentagramma triangularis</em></td>
<td>Goldback Fern</td>
<td>UPL</td>
</tr>
</tbody>
</table>

**RANUNCULACEAE – Buttercup Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aquilegia formosa</em></td>
<td>Crimson Columbine</td>
<td>FAC</td>
</tr>
<tr>
<td><em>Ranunculus californica</em></td>
<td>California Buttercup</td>
<td>FAC</td>
</tr>
<tr>
<td><em>Ranunculus muricatus</em></td>
<td>Prickle Fruited Buttercup</td>
<td>FACW</td>
</tr>
</tbody>
</table>

**RHAMNACEAE – Buckthorn Family**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Rhamnus ilicifolia</em></td>
<td>Holly-Leaf Redberry</td>
<td>UPL</td>
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</tbody>
</table>

**ROSACEAE – Rose Family**
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acaena pinnatifida var. californica</td>
<td>California Acaena</td>
<td>UPL</td>
</tr>
<tr>
<td>Aphanes occidentalis</td>
<td>Lady’s Mantle</td>
<td>UPL</td>
</tr>
<tr>
<td>Cotoneaster lacteus</td>
<td>Parney’s Cotoneaster</td>
<td>UPL</td>
</tr>
<tr>
<td>Cotoneaster pannosus</td>
<td>Silverleaf cotoneaster</td>
<td>UPL</td>
</tr>
<tr>
<td>Fragaria vesca</td>
<td>Wood Strawberry</td>
<td>UPL</td>
</tr>
<tr>
<td>Heteromeles arbutifolia</td>
<td>Toyon</td>
<td>UPL</td>
</tr>
<tr>
<td>Oemleria cerasiformis</td>
<td>Oso Berry</td>
<td>UPL</td>
</tr>
<tr>
<td>Potentilla glandulosa ssp. glandulosa</td>
<td>Sticky Cinquefoil</td>
<td>FAC</td>
</tr>
<tr>
<td>Pyracantha angustifolia</td>
<td>Pyracantha</td>
<td>UPL</td>
</tr>
<tr>
<td>Pyrus sp.</td>
<td>Pear</td>
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</tr>
<tr>
<td>Rosa californica</td>
<td>California Wild Rose</td>
<td>UPL</td>
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<tr>
<td>Rosa eglanteria</td>
<td>Sweet-brier</td>
<td>UPL</td>
</tr>
<tr>
<td>Rosa gymnocarpa</td>
<td>Wood Rose</td>
<td>UPL</td>
</tr>
<tr>
<td>Rubus discolor</td>
<td>Himalayan Blackberry</td>
<td>FACW</td>
</tr>
<tr>
<td>Rubus parviflorus</td>
<td>Thimbleberry</td>
<td>FAC+</td>
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<tr>
<td>Rubus ursinus</td>
<td>California Blackberry</td>
<td>FACW</td>
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<tr>
<td>RUBIACEAE – Madder Family</td>
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<td></td>
</tr>
<tr>
<td>Galium aparine</td>
<td>Bedstraw</td>
<td>FACU</td>
</tr>
<tr>
<td>Galium parisiense</td>
<td>Wall Bedstraw</td>
<td>FACU</td>
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<tr>
<td>Galium porrigens var. porrigens</td>
<td>Climbing Bedstraw</td>
<td>UPL</td>
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<tr>
<td>Sherardia arvensis</td>
<td>Field Madder</td>
<td>UPL</td>
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<tr>
<td>SALICACEAE - Willow Family</td>
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</tr>
<tr>
<td>Salix lasiolepis</td>
<td>Arroyo Willow</td>
<td>OBL</td>
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<tr>
<td>RUBIACEAE – Madder Family</td>
<td></td>
<td></td>
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<tr>
<td>SCROPHULARIACEAE – Figwort Family</td>
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<tr>
<td>Castilleja densiflora ssp. densiflora</td>
<td>Common Owl’s Clover</td>
<td>UPL</td>
</tr>
<tr>
<td>Castilleja foliolosa</td>
<td>Woolly Clover</td>
<td>UPL</td>
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<tr>
<td>Castilleja rubicundula ssp. lithospermoides</td>
<td>Cream Sacs</td>
<td>UPL</td>
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<tr>
<td>Collinsia sparsiflora var. sparsiflora</td>
<td>Few-flowered Collinsia</td>
<td>UPL</td>
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<tr>
<td>Mimulus aurantiacus</td>
<td>Sticky Monkey Flower</td>
<td>UPL</td>
</tr>
<tr>
<td>Mimulus guttatus</td>
<td>Common Monkey Flower</td>
<td>OBL</td>
</tr>
<tr>
<td>Scrophularia californica</td>
<td>California Figwort</td>
<td>FACW</td>
</tr>
<tr>
<td>Triphysaria eriantha</td>
<td>Butter and Eggs</td>
<td>UPL</td>
</tr>
<tr>
<td>Triphysaria pusilla</td>
<td>Dwarf Owl’s Clover</td>
<td>UPL</td>
</tr>
<tr>
<td>SOLANACEAE – Nightshade Family</td>
<td></td>
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</tr>
<tr>
<td>Solanum americanum</td>
<td>Common Nightshade</td>
<td>FAC</td>
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<tr>
<td>SAXODIACEAE – Sequoia Family</td>
<td></td>
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</tr>
<tr>
<td>Sequoia sempervirens</td>
<td>Coast Redwood</td>
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<tr>
<td>VALARINACEAE – Valerian Family</td>
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<tr>
<td>Centranthus ruber</td>
<td>Red Valerian</td>
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