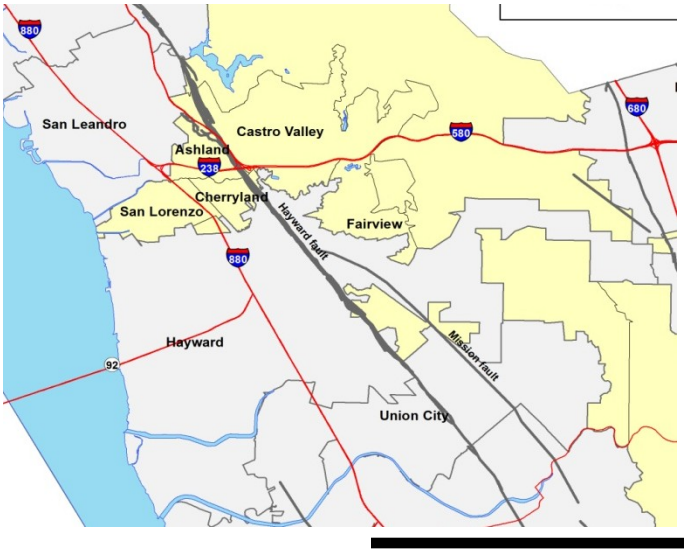
SAFETY ELEMENT



ALAMEDA COUNTY

Adopted January 8, 2013
Amended February 4, 2014

ALAMEDA COUNTY COMMUNITY DEVELOPMENT AGENCY

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CREDITS AND ACKNOWLEDGEMENTS

Alameda County Board of Supervisors
Scott Haggerty, District 1
Richard Valle, District 2
Wilma Chan, District 3
Nate Miley District 4
Keith Carson, District 5

Alameda County Planning Commission
Frank Imhof, District 1
Alane Loisel, District 1
Lawrence Ratto, District 2
Kathie Ready, District 3
Jeff Moore, District 4
Richard Rhodes, District 4
Mike Jacob, District 5

Alameda County Community Development Agency
Chris Bazar, Agency Director
Albert Lopez, Planning Director
Elizabeth McElligott, Assistant Planning Director
Angela Robinson Piñon, Senior Planner
Robert Taylor, GIS Analyst

SAFETY ELEMENT OF THE ALAMEDA COUNTY GENERAL PLAN

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INTRODUCTION

1.0 OVERVIEW

1.1. Planning Context

The County has determined that there is a need to conduct a comprehensive update of its Seismic Safety and Safety Elements (approved by the Board of Supervisors in 1982). Updating this document will provide an invaluable opportunity to create a consistent policy framework that can be applied throughout unincorporated Alameda County. This document presents the new and updated Safety Element of the Alameda County General Plan.

Alameda County's process to update the Safety Element occurred in three phases. During the first phase, staff compiled information regarding known seismic/geologic, flood, hazardous waste, and fire hazards. In addition, staff researched current, planned and ongoing disaster preparation efforts occurring within the County. Drafts of these reports were circulated internally and to the public for comment at various stages of development from May 2012 to November 2012.

In the second phase, existing County policies and implementation programs were evaluated to determine whether they adequately addressed the issues and needs identified in the inventory reports. The following documents were reviewed to identify existing policies that might be included in the new and updated elements and to assess gaps in the County's policies and programs.

- The Eden Area General Plan (March 2010)
- East County Area Plan as amended by Measure D (May 2002).
- The Castro Valley Plan (March 2012)

The final phase of the project was the public participation process which is documented below.

1.2. Citizen Participation

The inclusion of community stakeholders helps to ensure that appropriate disaster mitigation strategies are efficiently and effectively evaluated, developed, and implemented. The public outreach process consisted of the following strategies:

Public Meetings: The Planning Commission reviewed draft sections of the document. In total, the Commission hosted five meetings to discuss the Safety Element. In order to provide adequate opportunities for the public to provide input on the Safety Element text, the Commission agreed that staff would bring a working draft of each chapter for review. The Safety Element was also discussed at the Transportation and Planning Committee of the Board of Supervisors on December 3, 2012 and by the Unincorporated Services Committee of the Board on December 5, 2012.

Public Hearings: The Planning Commission held public hearings on May 21, 2012 to initiate the preparation of the Safety Element and on November 5 and November 19, 2012 to discuss the draft Safety Element in its entirety. In addition, the Board of Supervisors met on January 8, 2013 to discuss the adoption of the Safety Element. Public input was permitted at both of these meetings.

Outreach: Alameda County created a web page to keep the community informed about the preparation of the Safety Element. This web page provided links to the previous element, as well as documents from each of the meetings held by the Planning Commission.

1.3. Scope and Organization

The Safety Element is organized into four chapters which are described as follows:

- The *Introduction* provides an overview of the document and describes its purpose and authority.
- The *Natural Hazards* chapter discusses hazards arising from faults and geologic conditions, fires and flood related hazards and provides development standards intended to reduce risks associated with: ground shaking; structural failures; surface rupture; liquefaction; tsunamis or seiches; landslides/slope instability, fires and floods.
- The *Man Made Hazards* chapter identifies policies and programs to reduce risks associated with the creation, storage, transport and disposal of hazardous wastes. In addition, it provides information about the public airports operating within the County and development standards for airports or activities occurring within the vicinity of an airport.
- The *Emergency Preparedness* chapter describes how disaster planning and emergency response are coordinated within the County.

2.0 AUTHORITY AND PURPOSE

2.1. Authority for the General Plan and Its Constituent Elements

State law (Article 5, Section 65300 et seq.) requires the County to have a General Plan which contains seven elements: Land Use; Transportation; Housing; Open Space; Conservation; Safety and Noise. The plan expresses the County's vision for the future and is the roadmap for achieving the community's desired quality of life. It is an assessment of current and future needs, and the resources needed to implement the goals and policies established. As the needs of the County change, the Planning Department with citizen comment and input makes recommendations to the Board of Supervisors to reflect the direction for the future and to update the General Plan.

2.2. Element Purpose and Focus

This document comprises the required Safety Element of the Alameda County General Plan. The primary purpose of a safety element is to resolve development issues that arise from known or previously unknown hazards.

This Element includes descriptive information, analysis and policies pertaining to geologic, seismic, flood and fire hazards within the County. The focus of the Safety Element is to minimize human injury, loss of life, property damage, and economic and social dislocation due to natural and human-made hazards. The policies included in this Element sets forth general and broad goals, policies and implementation actions that are intended to provide more specific direction to current and future actions undertaken by the public and private sectors.

Furthermore, in October 2007, Governor Schwarzenegger signed Assembly Bill (AB) 162 which strengthens flood protections in California by requiring jurisdictions, upon the next revision of the mandatory Housing Element, on or after January 1, 2009, to update flood related information in its General Plan, including but not limited to the Conservation Element, Housing Element, Safety Element, and the Land Use Element. This update of the Safety Element is intended to comply with AB 162.

2.3. Relationship to the General Plan

Alameda County’s existing General Plan comprises area plans for the County’s unincorporated rural and urbanized areas as well as the required County-wide elements. The area plans contain the land use and circulation policies for their specific areas. The Housing, Open Space, Resource, Conservation, Seismic Safety and Safety, and Noise Elements contain general policies that pertain to the entire unincorporated

area of Alameda County. This document updates and supersedes the existing Seismic Safety and Safety Elements (1982).

2.4. Consistency with Other Portions of the General Plan

The Safety Element is part of the Alameda County General Plan. The Element presents background data and analysis, and policies and implementation recommendations which supplement materials contained in other portions of the General Plan. The Safety Element taken together with these other documents comprise the Alameda County General Plan.

State law requires the elements of the General Plan to be consistent. The Safety Element is consistent with all of the other elements of the General Plan, in that it does not require any significant changes to the other elements of the General Plan, or recommend policies and programs that would contradict the goals and policies contained therein. The Safety Element's goals should be interpreted and implemented consistent with those in other portions of the General Plan. As the General Plan may be amended over time, goal, policies, and implementing programs in other General Plan elements will be comprehensively reviewed for internal consistency.

The following text provides a brief overview of the General Plan Elements, as well as the County's process for maintaining consistency between each document.

The Alameda County General Plan consists of a number of elements, both geographic and functional. The Safety Element developed as a separate document containing background and policy information that is useful in guiding public and private decisions affecting safety. In the event that policies conflict with earlier elements, the more recently adopted policies will prevail.

Supplemented by background information, analysis and policy statements, the following Elements and Plans, including the updated Safety Element, comprise the comprehensive General Plan for the County:

- Castro Valley Plan, adopted March 2012
- Alameda County Housing Element, adopted April 2011
- Eden Area General Plan, adopted March 2010
- East County Area Plan, adopted May 1994; modified by voters through Measure D, November, 2000, codified by Board of Supervisors May, 2002
- Open Space Element, adopted May 1973, and amended May 1994

- Conservation Element, adopted January 1976, and amended May 1994
- Noise Element, adopted January 1976, and amended May 1994
- Park and Recreation Element, adopted June 1956, and amended May 1994
- Scenic Route Element, adopted May 1966, and amended May 1994

Parts of the 2002 revised East County Area Plan (ECAP) evolved out of voter support for Measure D (2000) and therefore will not be superseded by the Safety Element. In this case, the County has made a concerted effort to ensure that the Safety Element is consistent with Measure D.

In addition, the County is currently revising its Resource, Conservation and Open Space Elements and is working on an additional Agriculture Element to the General Plan. These Elements will be cross-referenced with the Safety Element to ensure that they are consistent with one another.

2.5. State Required Consultation

Pursuant to Government Code Section 65302 (g), staff contacted the State Division of Mines and Geology and the State Office of Emergency Services to advise them that preparation of the County Safety Element was about to commence and to solicit advice concerning plan preparation. In September 2012, drafts of the Safety Element were sent to their offices for consideration, and no further action is needed.

3.0 REGIONAL AND LOCAL CONTEXT

3.1. Regional Setting

Alameda County, one of the nine San Francisco Bay Area counties, is located along the eastern shore of the San Francisco Bay. The County covers approximately 738 square miles, and is one of only two Bay Area counties that spans an area that reaches from the Bay to California's Central Valley. The western portion of Alameda County is located generally on the East Bay Plain between the coastal hills and the Bay. The area is heavily urbanized and contains the incorporated cities of Albany, Berkeley, Emeryville, Piedmont, Oakland, Alameda, San Leandro, Hayward, Union City, Newark, and Fremont, as well as the unincorporated urban areas of Castro Valley, Fairview, San Lorenzo, Ashland, and Cherryland.

Eastern Alameda County is primarily composed of the coastal range's rough terrain that extends from the hills above the Bay Plain to the border with San Joaquin County in the Central Valley. It is comprised

mainly of non-urban uses including agriculture, parkland, watershed, and open space. This area has relatively low population density except for the Livermore-Amador Valley, in which the incorporated cities of Dublin, Pleasanton, and Livermore are located. A map of the county in its regional context is provided as Figure i-1.

3.2. Planning Area

The Safety Element covers the unincorporated areas of Alameda County which include the communities of Ashland, Castro Valley, Cherryland, Fairview, unincorporated Livermore, San Lorenzo, and Sunol. A map of the Planning Area is provided as Figure i-2.

3.3. Intergovernmental Planning Coordination

In preparing the Element staff has consulted with the following departments to ensure that the proposed amendments are consistent with the County's disaster mitigation and preparation efforts:

- Alameda County Sherriff's Office
- Alameda County Fire Department
- Alameda County General Services Agency
- Alameda County Public Works Agency
- Alameda County Department of Public Health
- Alameda County Department of Environmental Health
- Alameda County Flood Control and Water Conservation District
- The Zone 7 Water Agency

4.0 RISK

4.1. Risk Determination

The efficiency of safety and noise programs lies in the definition of acceptable levels of risk for the community. The criteria for determination of risk is based upon:

- Reduction of loss in life and injuries
- Reduction or prevention of property damage
- Prevention of economic and social dislocations

Based upon these criteria a risk may be categorized as acceptable, unacceptable, and avoidable. The determination of acceptable and unacceptable risk requires judgments based on weighing several factors including the nature of the hazard, the frequency, or risk, of a damaging event associated with the hazard, and the relative number of persons exposed to the risk. The degree or intensity of any specific hazard is a major consideration in public mitigation efforts. Thus, hazards with a high life-loss potential are less acceptable than hazards which primarily affect property, and hazards which could impact entire communities are less acceptable than hazards which may impact relatively few persons. Only minimal risk to critical facilities and functions (including water supply, emergency services, evacuation routes, and medical and mass care facilities) is considered acceptable since these facilities and functions are critical to disaster recovery for entire communities.

The County is not able to guarantee that any particular development will not, at some time in the future, be adversely affected by the hazards identified in this element because such hazards, by their nature, defy precise prediction. In those instances where there is a significant factual question about whether a particular development has mitigated risks from natural hazards to an "acceptable" level and the property owner wishes to proceed in the face of such factual question, the County may require the owner of the property to provide indemnification to the County, insurance or other security and a recorded notice which will protect the interests of the County and provide notice of the potential problem to future purchasers.

5.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

5.1. Overview of CEQA

The California Environmental Quality Act (CEQA) is a state law that requires state and local government to consider the potential environmental effects of a project before a decision is made. Under CEQA, a project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment. CEQA's purpose is to disclose the potential impacts of a project, suggest methods to minimize those impacts, and discuss project alternatives so that decision-makers will have full information upon which to base their decision. CEQA

also provides for review of environmental documents by government agencies and the public in order to provide a thorough and transparent environmental review process.

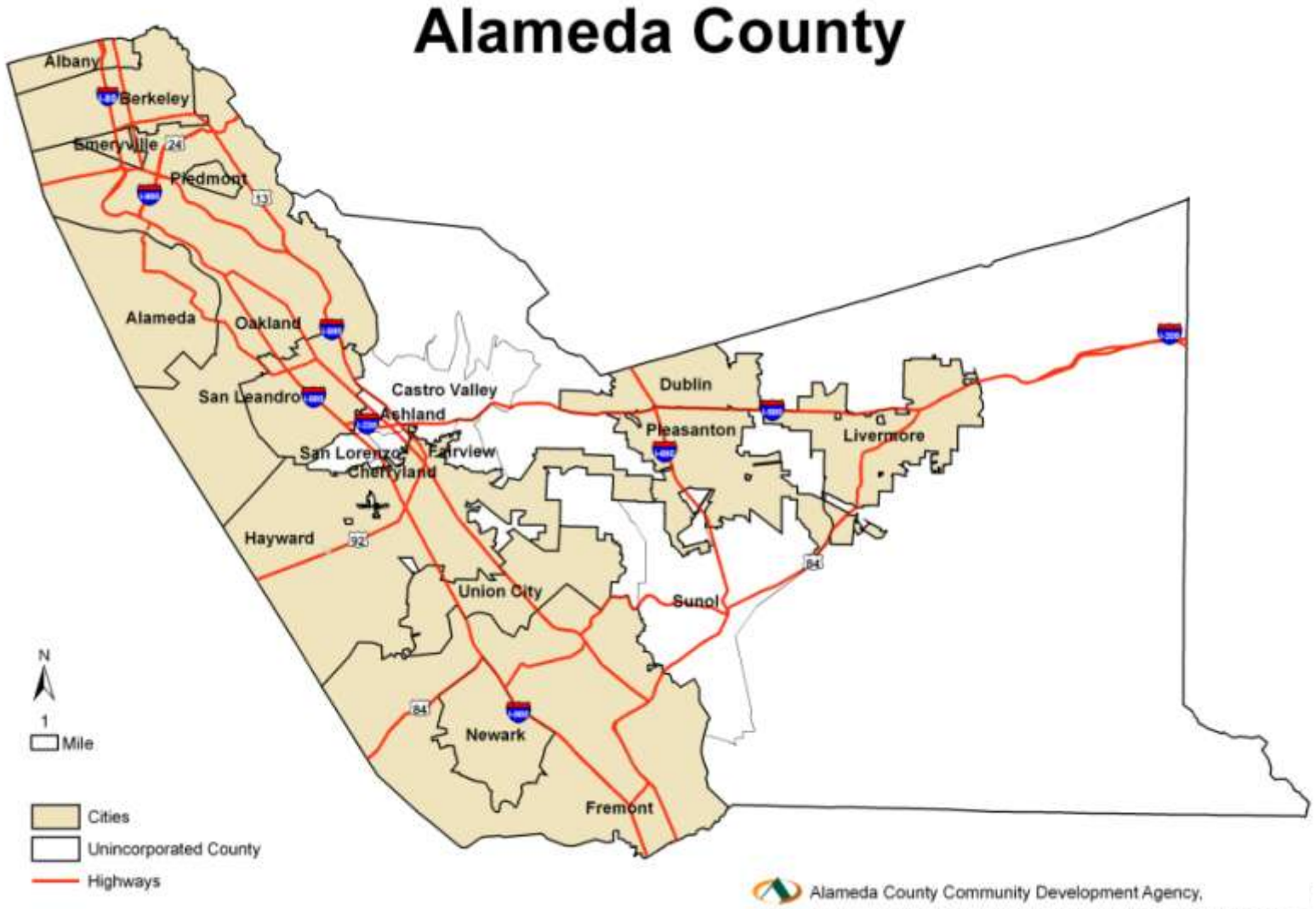
Most proposals for physical development in California are subject to the provisions of CEQA, as are many governmental decisions which do not immediately result in physical development (such as adoption of a general or community plan). Every development project which requires a discretionary governmental approval will require at least some environmental review pursuant to CEQA, unless an exemption applies.

The Safety Element of the Alameda County General Plan has been analyzed in accordance with CEQA. The Initial Study and Negative Declaration prepared for this element is available as a separate document.

5.2. CEQA and Hazards

Projects that would result in a seismic/geologic, flood, fire, noise, or aviation hazard, or that involve hazardous materials generally require some discretionary level review. As such these projects will be reviewed in accordance with the provisions of the Act.


Regional Setting
Sacramento
Marin
Contra Costa
San Joaquin
San Francisco
Oakland
Alameda
Piedmont
Dublin
Pleasanton
Livermore
Hayward
Union City
Newark
Fremont
San Mateo
Santa Clara
Stanislaus
N
Miles
0 2 4 8
Alameda County Community Development Agency May 2012


Alameda County
Albany
Berkeley
Emeryville
Piedmont
Alameda
Oakland
San Leandro
Castro Valley
Ashland
San Lorenzo
Fairview
Cherryland
Hayward
Union City
Newark
Fremont
Dublin
Pleasanton
Livermore
Sunol
N
1
Mile
Cities
Unincorporated County
Highways
Alameda County Community Development Agency,

CHAPTER 1: NATURAL HAZARDS

1.0 PURPOSE AND INTENT

This chapter describes natural hazards present within unincorporated Alameda County and goals, policies and actions to minimize the losses due to seismic/geologic, fire and flood hazards.

2.0 SEISMIC/GEOLOGIC HAZARDS

2.1. Background

An earthquake is the release of stored energy from the earth's crust. The energy is released along a fault or a plane of weakness between two large masses of the earth's crust or its outer surface. The crust, between 10 to 15 miles thick in Alameda County, is fractured along fault lies. At a global scale, for reasons that are not completely known, pieces of the earth's crust are moving. Typically, two crustal masses move past one another at a rate of less than one inch per year. The energy released from an earthquake may be so small as to go unnoticed, except by sensitive measuring instruments or of an intensity so large it can destroy any structure within its range.

The Planning Area is located in the San Andrea and Hayward fault zones, one of the most seismically active regions in the United States. This site has been the location of numerous moderate to strong earthquakes. Due to the high level of seismic activity, much of the area has been classified as seismic risk Zone 4, the highest risk category specified under the California Building Code.

Earthquakes can lead to various seismic hazards including: ground shaking, liquefaction, ground rupture and the generation of large waves in bodies of water. Seismic hazards may vary from area to area, and the level of risk is tied to the geologic conditions and the extent of land use proposed for any given site.

The strength of an earthquake is measured using the Richter scale, a numerical scale for quantifying an earthquake's magnitude. The force of an earthquake at a particular place is measured on the Modified Mercalli (MM) Scale. The MM scale is a subjective ranking of the earthquakes effect on persons and structures. Table S-1 summarizes the relationship between these two measurements. Table S-2 provides an abbreviated description of the MM scale.

Table S - 1: Relationship between the Richter and Modified Mercalli Scales[1]

Richter Magnitude	Modified Mercalli Category
1.0 - 3.0	I
3.0 - 3.9	II-III
4.0 - 4.9	IV-V
5.0 - 5.9	VI-VII
6.0 - 6.9	VII-IX
7.0 and higher	VIII or higher
8+	X-XI

Table S - 2: Abbreviated Modified Mercalli Scale[2]

Modified Mercalli Category	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

[1] U.S. Geological Survey (USGS), http://earthquake.usgs.gov/learn/topics/mag_vs_int.php
[2] Ibid.
[3] E.J. Helley and R.W. Graymer, 1997, *Quaternary Geology of Alameda County, and Parts of Contra*

2.2. Setting and Geomorphology

Alameda County is located on the East Bay of the San Francisco Bay Region of Central Coastal California. Principal physiographic features include the Bay plain and Diablo Range. Alameda County lies within the bounds of the Coast Ranges geomorphic province. The Coast Range geomorphic province includes the northwest trending belt of mountain ranges, valleys, and basins that parallel the California coastline from Point Conception north to the Oregon border. It is bounded on the north by the south flank of Mount Diablo, one of the highest peaks in the Bay Area, reaching an elevation of 3,849 ft. San Francisco Bay forms the western boundary, the San Joaquin Valley borders it on the east and an arbitrary line from the Bay into the Diablo Range forms the southern boundary.[3]

The bay plain and the valley areas of Alameda County are underlain by Quaternary (from the present to 2 to 3 million years ago) unconsolidated deposits which, in turn, are underlain by sedimentary metamorphic and igneous rocks of up to 150 million years in age. The Quaternary deposits consist primarily of alluvial and estuarine sediments. The alluvial ranges from stream deposited sans, gravel, silts, clays and intermixtures to fine windblown sand. Estuarine sediments consists of silty clays and some sand and shell layers deposited in the bay and marshlands. Adjacent to the San Francisco Bay the younger alluvial deposits grade into younger bay mud, a variable, semi-fluid to firm silty clay with lenses of water-saturated fine sand. Younger bay mud is covered by landfills that vary from dense, engineered fills to trash accumulations of uncertain geotechnical properties.[4]

Bedrocks of various types and age underlie the areas within the Diablo Range. Almost all of the hills have a mantle of topsoil and weathered bedrock. These soil materials vary in depth from a few to many feet and present a substantial slope instability hazard. Where the bedrock is well bedded and erosion of man-made excavation undercuts the bedding, slope instability problems exist.[5]

2.3. Active and Potentially Active Faults

The County has been subjected to numerous seismic events, originating both on faults within the County and in other parts of the region. Six major Bay Area earthquakes have occurred since 1800 that have affected the County, and at least two of the faults that produced them run through or into the County. These earthquakes and the originating faults include the 1836 and 1868 earthquakes on the Hayward-Rogers Creek fault, and the 1861 earthquake on the Calaveras fault. Three earthquakes, in 1838, 1906 and 1989 originated on the San Andreas fault, west of the county near San Francisco or to the south. The

[3] E.J. Helley and R.W. Graymer, 1997, *Quaternary Geology of Alameda County, and Parts of Contra Costa, Santa Clara, San Mateo, San Francisco, Stanislaus, and San Joaquin Counties, California: A Digital Database, U.S. Geological Survey*, http://geopubs.wr.usgs.gov/open-file/of97-97/alqgeo.pdf
[4] Ibid.
[5] Ibid.

Working Group of California Earthquake Probabilities has determined that earthquakes of equally destructive forces are a certainty within the region.[6] According to their findings, the Hayward-Rodgers Creek fault system is estimated to have a probability of 31% of producing an earthquake of a magnitude of 6.7 or higher within the next 30 years, this probability is the highest of the Bay Area faults.

Faults that have been active during the Holocene period, approximately the last 11,000 years, are considered to be active faults, and those faults that have been active during the Quaternary period, approximately the last 1.8 million years, are considered to be potentially active faults.[7] This serves to differentiate faults for which sufficient evidence of recent activity has been noted to explicitly include them as known geologic hazards, distinct from those faults for which recent displacement is known or suspected, and whose latest activity has not been determined, but may have been within approximately the last 11,000 years. In addition to faults that have been classified as active or potentially active, there are others whose activity has not been clearly established by presently available information. Some of these faults are shown on Table S-2; others remain to be studied. Figure S-1 maps the location of active and potentially active faults within the County.

Other active faults within the unincorporated areas include the Calaveras, Greenville, and Las Positas faults, as well as several potentially active faults and unnamed secondary faults adjacent to these faults. There are few or no studies pertaining to these additional secondary faults; therefore it is unknown if these faults may or may not experience secondary ground rupture during a large earthquake. Table S-3 summarizes the active faults within the planning area and Table S-4 provides a summary of potentially active faults.

Scientists have yet to determine a way in which to predict the precise day and time of the next earthquake; however, past evidence points to the conclusion that areas of historically high seismicity[8] are the locations where damaging earthquakes are most likely to occur in the future.

[6] Working Group of California Earthquake Probabilities, 2008, *The Uniform California Earthquake Rupture Forecast Version 2 (UCERF 2)*, U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 http://pubs.usgs.gov/of/2007/1437/

[7] California Geological Survey, *Note 31: Faults and Earthquakes in California*, 2003, http://www.consrv.ca.gov/CGS/information/publications/cgs_notes/note_31/note_31.pdf

[8] Seismicity is earth movement phenomena as related to earthquakes and also a measure of an area's susceptibility to earthquakes.

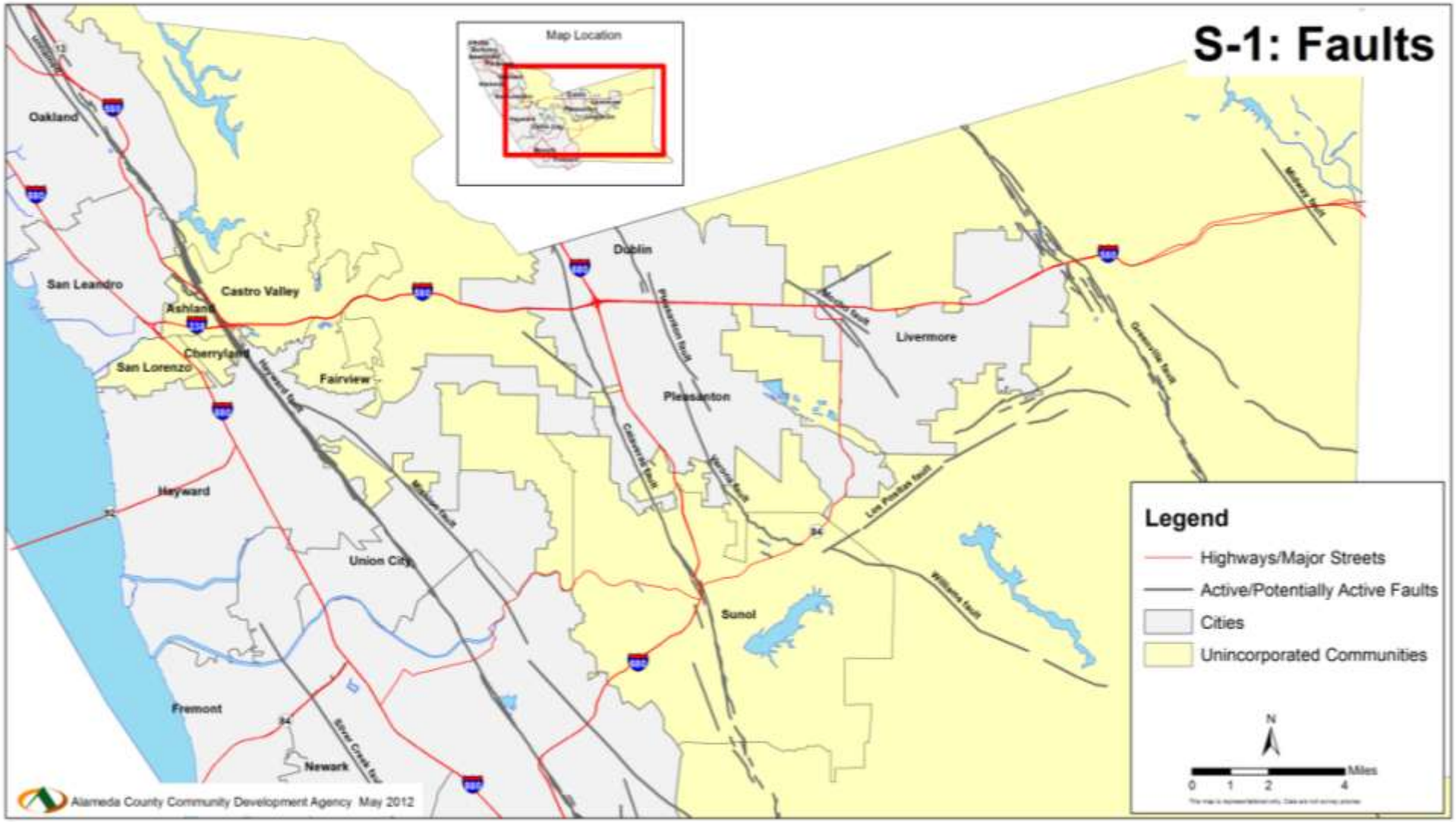

S-1: Faults
Map Location
Oakland
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Fremont
Newark
Dublin
Pleasanton
Livermore
Sunol
Hayward fault
Calaveras fault
Verona fault
Las Positas fault
Williams fault
Mocho fault
Greenville fault
Legend
Highways/Major Streets
Active/Potentially Active Faults
Cities
Unincorporated Communities
N
Miles
0 1 2 4
Alameda County Community Development Agency May 2012

Table S - 3: Active Faults within unincorporated Alameda County[9]

Fault	Classification	Criteria for Classification	Probability of Earthquake with a Magnitude ≥ 6.7 (Richter)	Estimated Maximum Magnitude (Richter)[10]
Hayward-Rogers Creek[11]	Active	Historical surface faulting, strong earthquakes	31%	6.5-7.3
Calaveras[12]	Active	Historical surface faulting, strong earthquakes	7%	5.7-7.0
Greenville-Las Positas	Active	Surface faulting	3%	6.8-7.0

Note: This list is not exhaustive. Additional information may establish that other faults in the County to be active, potentially active, or inactive.

Table S - 4: Potentially Active Faults within unincorporated Alameda County

Fault	Classification	Criteria for Classification	Probability of Earthquake with a Magnitude ≥ 6.7 (Richter)	Estimated Maximum Magnitude (Richter)
Verona[13]	Potentially Active	Offset of soil deposits	Undetermined	Undetermined
Williams[14]	Potentially Active	Recent seismicity	Undetermined	Undetermined
Midway[15]	Potentially Active	Field observations	Undetermined	Undetermined
Mocho[16]	Activity Unknown	Field observations	Undetermined	Undetermined
Mission	Inactive	Geologic setting, microearthquake epicenters	Not Applicable	Not Applicable

[9] 2007 Working Group on California Earthquake Probabilities, 2008, *The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2)*, U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 http://pubs.usgs.gov/of/2007/1437/

[10] Ibid. The ranges provide an estimate of the maximum intensity along various segments of the fault.

[11] Ibid. The Hayward-Rogers Creek Fault consists of three segments: the Hayward North, Hayward South, and Rogers Creek.

[12] Ibid. The Calaveras Fault is comprised of three segments: the Calaveras North, Calaveras Central and Calaveras South.

[13] Unruh, Jeff and Sunderman, Sean, 2006, *Final Technical Report, Digital Compilation of Thrust and Reverse Fault Data for the Northern California Map Database: Collaborative Research with William Lettis & Associates, Inc., and the U.S. Geological Survey* http://www.deltarevision.com/2006_docs/2006thrust_final_report.pdf

[14] Ibid.

[15] Clark, M. M., et al, 1984, *Preliminary Slip-rate Table and Map of Late Quaternary Faults of California*, U.S. Geological Survey

[16] Carpenter, D.W. et al, 1984, *Geology of the Lawrence Livermore National Laboratory Site and Adjacent Areas* http://www-erd.llnl.gov/library/UCRL-53316.pdf. This fault has also been associated with the Greenville fault.

2.4. Hazards

Ground Shaking

Ground shaking is the source of the most widespread earthquake damage. An earthquake produces seismic waves that emanate in all directions from the fault rupture surface. The seismic waves cause strong ground shaking, which typically is strongest near the fault and diminishes as the waves move through the earth away from the fault. The severity of ground shaking at a particular site is controlled by the interaction of several factors, including:

- the distance from the earthquake source; and
- earthquake magnitude; and
- the directivity (focusing of earthquake energy along the fault axis rather than perpendicular to the fault); and
- condition of underlying geologic materials (bedrock, sediment, soils, and man-made fill)[17]

Research occurring after the 1989 Loma Prieta earthquake has shown that areas underlain by unconsolidated, or man-made fill may amplify the strength and duration of strong ground motions, increasing the risk of damage.[18] These findings are consistent with earlier evidence suggesting that structures placed on man-made fill are especially susceptible to earthquake hazards. Strong ground shaking caused by fault movement during an earthquake has the potential to result in significant loss of life and property damage throughout the Planning Area. Maximum ground shaking would be expected to result from a large earthquake on one of the nearby active faults as described in Table S-2, although strong ground shaking may also occur as a result of moderate or large earthquakes on other faults in the San Francisco Bay region.

Structural Failures

As was noted above, ground shaking intensity is highly variable from one site to another. In addition, the effect of ground shaking on structures is related to their form, structural design, materials, construction quality, and location. One of the objectives of the California Building Code (CBC) is to protect the life and safety of building occupants and the public. The County has adopted the CBC as the basis of the County Building Ordinance (Chapter 15.08 of its General Ordinance Code). The application of the design and

[17] ABAG, *On Shaky Ground, 1995, 1998*, http://www.abag.ca.gov/bayarea/eqmaps/doc/contents.html

[18] Stewart, Jonathan, 1997, *Key Geotechnical Aspects of the 1989 Loma Prieta Earthquake*, http://nisee.berkeley.edu/loma_prieta/stewart.html

construction standards of Chapter 15.08 should ensure that new construction will withstand the forces associated with a major earthquake. Since the 1970s, the CBC has used data on the response of structures to earthquakes as a basis for structural design. However, buildings constructed prior to the mid-1970's generally would not meet current design provisions for earthquake forces as prescribed in the Chapter 15.08 of the County's General Ordinance Code. Of these buildings, concrete tilt up structures, unreinforced masonry and soft story buildings, and older single family homes that have not been seismically retrofitted are the most susceptible to damage. Special occupancy buildings, including schools, hospitals, and other structures important to protecting public health and safety, are required by the State, and by Chapter 15.08, to meet more stringent design requirements.

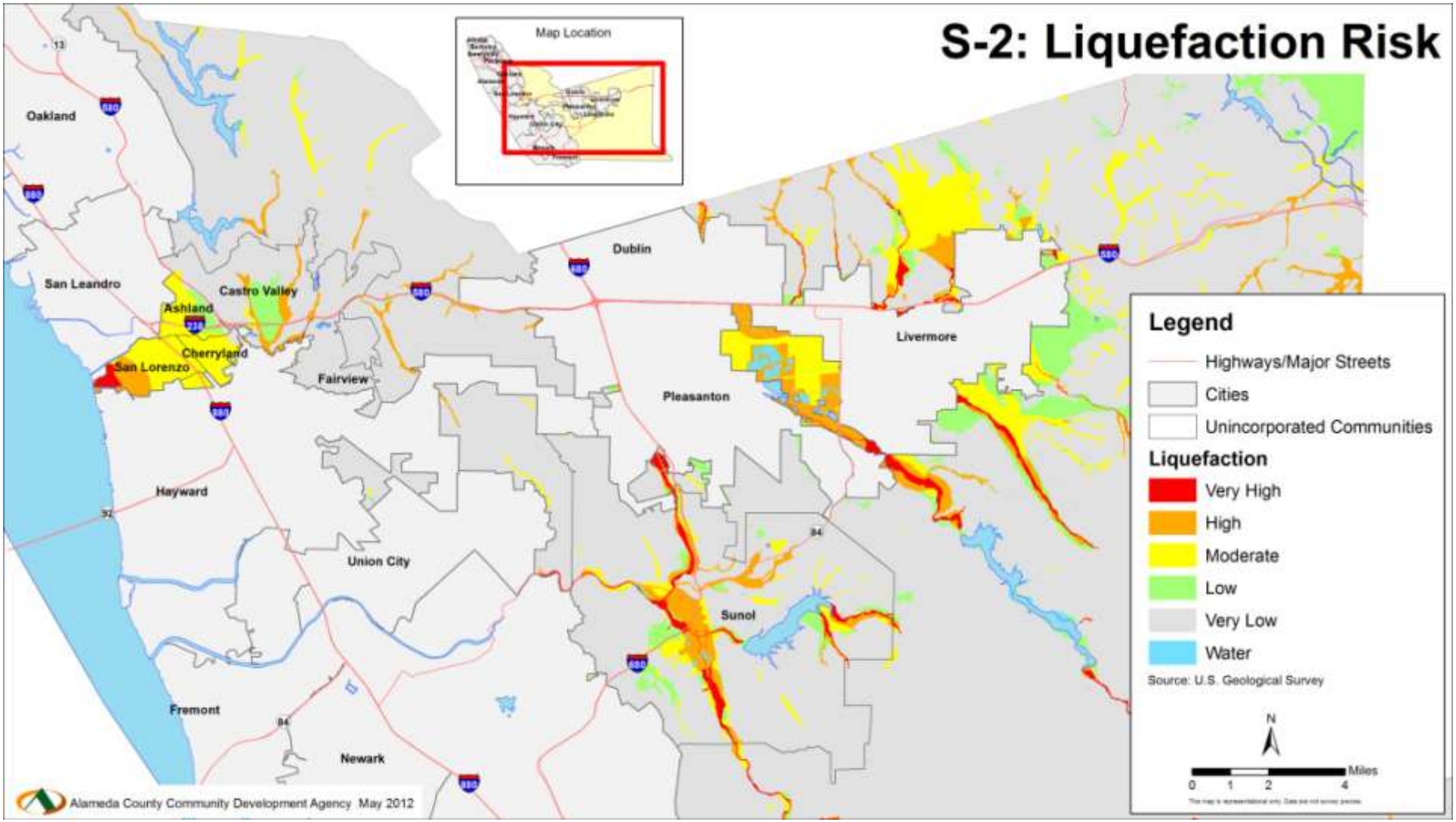
Surface Rupture

Surface fault rupture occurs when a movement on a fault deep within the earth breaks through the surface causing ground displacement. Ground rupture occurs along fault lines, and is normally limited to a fairly narrow zone along the trend of the primary fault, and to a lesser degree along secondary faults. The Alquist-Priolo Fault Zoning Act was developed by the State of California to regulate development occurring near active faults and to mitigate the risks associated with surface rupture.

Liquefaction

Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment to a fluidlike state and is typically caused by strong ground shaking during an earthquake. Liquefaction can result in substantial loss of life, injury, and damage to property. In addition, liquefaction increases the hazard of fires because of explosions induced when underground gas lines break, and because the breakage of water mains substantially reduces fire suppression capability.

The potential for liquefaction to occur depends on both the susceptibility of near-surface deposits to liquefaction, and the likelihood that ground motions will exceed a specified threshold level. Much of the Planning Area is in the vicinity of an active fault (See Figure S-1); thus, the immediate area surrounding the earthquake epicenter will be exposed to strong ground shaking should a large earthquake occur. Areas most susceptible to liquefaction are underlain by loose granular sediments and low-lying lands adjacent to creeks and estuaries. Figure S-2 shows the liquefaction risk for the County.


S-2: Liquefaction Risk
Map Location
Oakland
San Leandro
Ashland
Cherryland
San Lorenzo
Castro Valley
Fairview
Hayward
Union City
Fremont
Newark
Dublin
Pleasanton
Livermore
Sunol
Legend
Highways/Major Streets
Cities
Unincorporated Communities
Liquefaction
Very High
High
Moderate
Low
Very Low
Water
Source: U.S. Geological Survey
N
Miles
0 1 2 4
Alameda County Community Development Agency May 2012

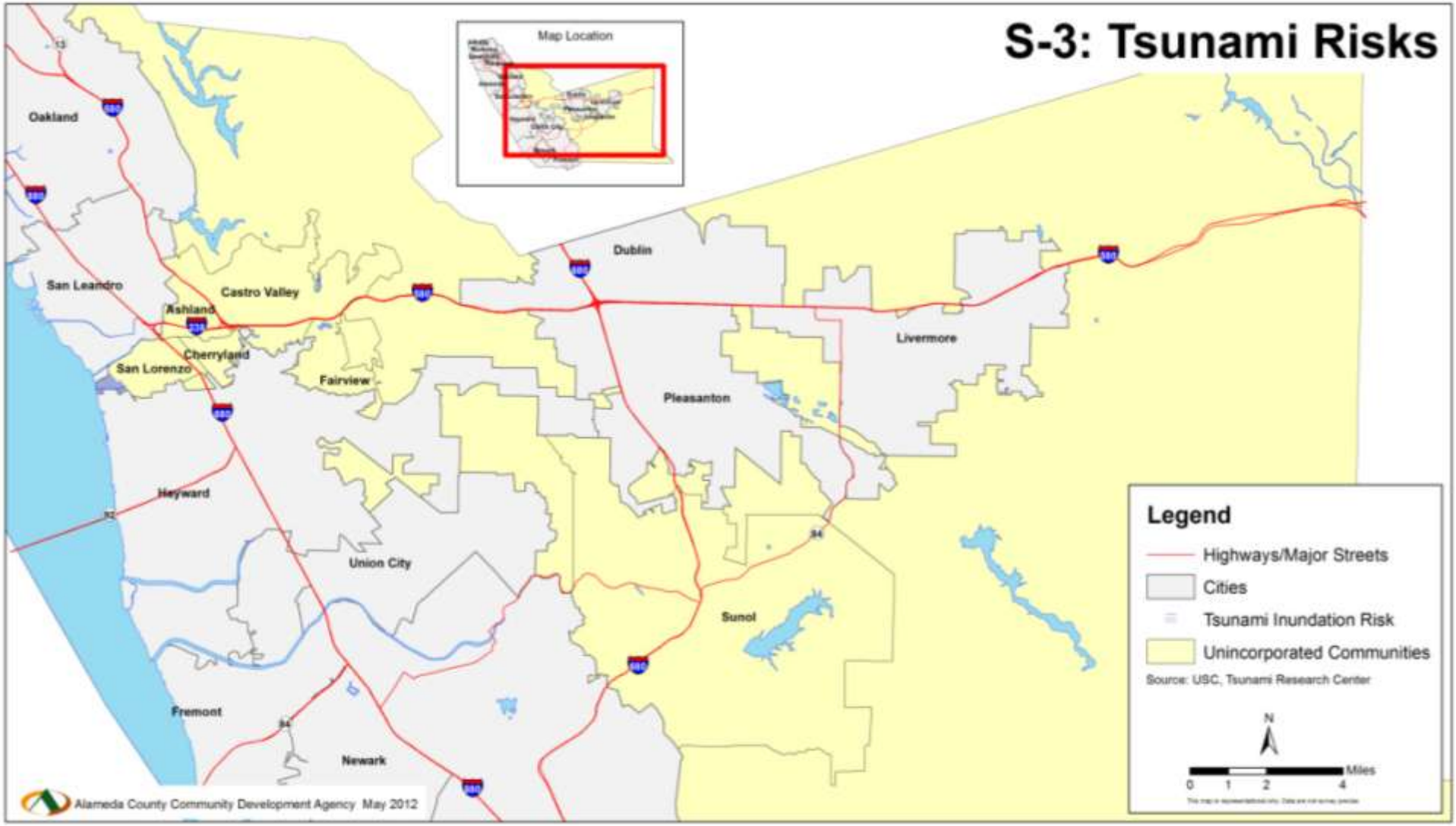
Tsunamis or Seiches

A major hazard associated with earthquakes is water inundation resulting from a tsunami or seiche. Tsunamis are a series of waves typically produced by an offshore earthquake, volcanic eruption, or landslide. A tsunami with a wave height of 20 feet at the Golden Gate Bridge, which is likely to occur approximately once every 200 years, would result in a runup of less than 10 feet above sea level on lands surrounding the San Francisco Bay.[19] Some areas of San Lorenzo may be subject to flooding if a tsunami were to occur. Figure S-3 is a map of tsumani hazards within unincorporated Alameda County.

A seiche is a long wave set up on an enclosed body of water such as a lake or reservoir. Seiches are inundations of the water surface that travel back and forth at regular periods determined by the depth and size of the water body. Seiches are usually caused by unusual tides, winds or currents, but may also be triggered by earthquake ground motion. The largest seiche wave ever measured in the San Francisco Bay, following the 1906 earthquake, was four inches high. Despite this occurrence, the Bay Area has not been adversely affected by seiches during its history within this seismically active region of California.[20] While damage caused by a seiche has not been reported since the 1906 earthquake, the various lakes and reservoirs within the unincorporated areas may be at risk of a seiche in the event of an earthquake.

[19] Ritter, J. R.; Dupre, W. R., 1972, *Maps Showing Areas of Potential Inundation by Tsunamis in the San Francisco Bay Region, California,* U.S. Geological Survey

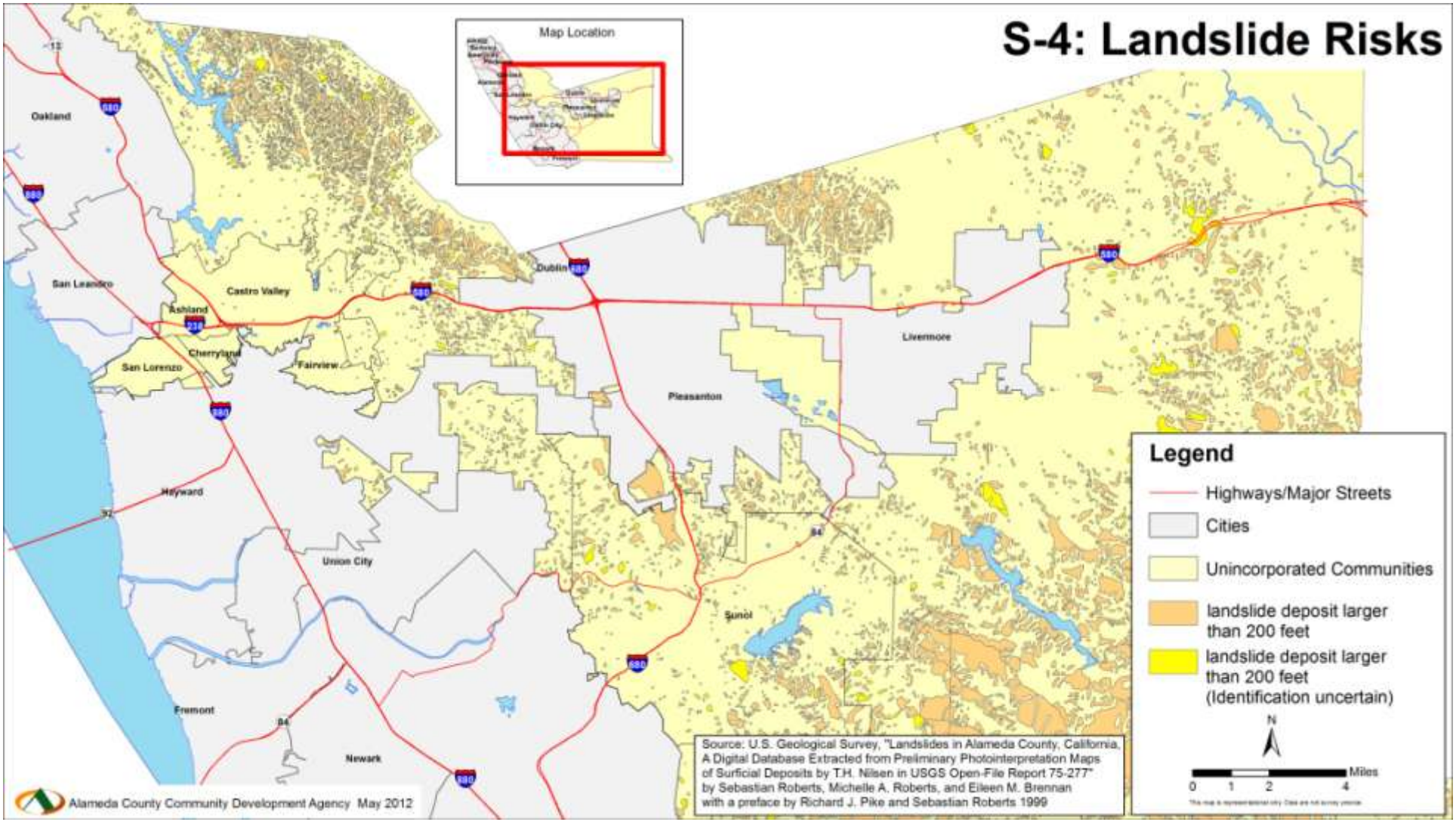
[20]U.S. Army Corps of Engineers San Francisco District, Port of Oakland, May 1998, Updated January 2000, *Oakland Harbor Navigation Improvement (-50 Foot) Project SCH No. 97072051 Final Environmental Impact Statement/Report*


S-3: Tsunami Risks
Map Location
Oakland
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Fremont
Newark
Dublin
Pleasanton
Livermore
Sunol
Legend
Highways/Major Streets
Cities
Tsunami Inundation Risk
Unincorporated Communities
Source: USC, Tsunami Research Center
N
Miles
0 1 2 4
Alameda County Community Development Agency May 2012

Landslides/Slope Instability

Landslides and slope instability are generally caused by earthquakes, weak materials, stream and coastal erosion, and heavy rainfall. The rate of landsliding is affected by the type and extent of vegetation, the slope angle, the degree of water saturation, the strength of the rocks, and the mass and thickness of the deposit. In addition, certain human activities tend to make the earth materials less stable and increase the chance of ground failure. Activities contributing to instability include extensive irrigation, poor drainage or ground-water withdrawal, removal of stabilizing vegetation and over-steepening of slopes by undercutting them or overloading them with artificial fill. The causes of failure, which normally produce landslides and differential settlement, are augmented during earthquakes. As a result of these potential risks, construction on slopes steeper than about 15 percent typically requires special grading, special foundation design, or site modification to mitigate slope ground conditions and reduce the potential for slope instability. Threats to structures would be greatest in areas that are close to natural channels or are situated on potentially unstable slopes.

Figure S-4 is a map of landslide risks within unincorporated Alameda County. The mapping indicates those areas that are considered “least susceptible,” “marginally susceptible,” “generally susceptible,” and “most susceptible” to slope failure. The criteria used to delineate the relative hazard areas included the nature of the geologic materials underlying the surface, the steepness of slopes, the presence or absence of visible slope failures, and the presence or absence of active forces that could cause failures, such as stream processes or shrink-swell potential soils.


S-4: Landslide Risks
Map Location
Oakland
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Fremont
Newark
Dublin
Pleasanton
Livermore
Sunol
Legend
Highways/Major Streets
Cities
Unincorporated Communities
landslide deposit larger than 200 feet
landslide deposit larger than 200 feet (Identification uncertain)
N
Miles
0 1 2 4
Source: U.S. Geological Survey, "Landslides in Alameda County, California, A Digital Database Extracted from Preliminary Photointerpretation Maps of Surficial Deposits by T.H. Nilsen in USGS Open-File Report 75-277" by Sebastian Roberts, Michelle A. Roberts, and Eileen M. Brennan with a preface by Richard J. Pike and Sebastian Roberts 1999
Alameda County Community Development Agency May 2012

2.5. Development Standards for Known Seismic and Geologic Hazards

The County is statutorily obligated to follow certain requirements with respect to the permitting and construction of new (or modifications to existing) buildings for human occupancy. Site specific investigations are required within Alquist-Priolo and Seismic Hazard Zones (both described below), and reports must be prepared that address hazards (mitigation for liquefaction and landslide potential) identified at the project site (please see Actions A3 and A12). The following is a summary of development guidelines and regulations pertaining to seismic and geologic hazards.

The Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code 2621, et seq.) was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to limit the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. Under the Act, development of a building for human occupancy is generally restricted within 50 feet of an identified fault. A fault or fault zone is considered active under the provisions to the act if there is evidence of surface displacement in the last 11,000 years. The California Geological Survey has produced a document entitled *Fault-Rupture Hazard Zones in California: Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps* which may be accessed at the following webpage ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf to clarify the roles and responsibilities of local jurisdictions and the State in implementing the Act.

The Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (Public Resources Code 2690, et seq.), (SHMA) passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides. The SHMA requires the California Geological Survey (CGS) (formerly the Department of Mines and Geology, DMG) to prepare new Seismic Hazard Zone Maps showing areas where liquefaction or earthquake-induced landslides have historically occurred or where there is a high potential for such occurrences. The purpose of the maps is to help reduce and, where feasible, mitigate earthquake hazards in new construction. The County is required to use the maps in the regulatory process to mitigate the potential danger and high costs of such events. CGS has prepared a document entitled *Guidelines for Evaluating and Mitigating Seismic Hazards in California, 2008* which may be accessed here http://www.conservation.ca.gov/cgs/shzp/webdocs/Documents/SP117.pdf to ensure ongoing compliance with the SHMA.

The Alameda County General Ordinance Code

Section 15.08.240 of the Alameda County Building Ordinance requires applicants for new construction to submit soils or geologic reports for sites affected by a number of seismic and geologic hazards. In addition, new structures are required to incorporate design elements to reduce building failures. The Grading, Erosion and Sediment Control Ordinance (Alameda County General Ordinance Code, Chapter 15.36) establishes standards for grading, construction and the control of erosion and sediments. In addition, Section 15.36.110 of the County Grading Ordinance gives the Director of Public Works the authority to require a soils and geologic investigation in support of any proposed development on private property. Chapter 16, the Subdivision Ordinance, contains various provisions relating to the investigation of seismic and geologic hazards, and the design and construction of improvements relating to the subdivision of property.

The California Environmental Quality Act (CEQA)

CEQA requires that all projects be evaluated to determine if they "expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:"

1. 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.

2. Strong seismic ground shaking.

3. Seismic-related ground failure, including liquefaction.

4. Landslides.

Projects must also be evaluated for their potential to:

- Result in substantial soil erosion or the loss of topsoil.

- 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.

- Be located on expansive soil, as defined in the California Building Code, creating substantial risks to life or property.

- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

2.6. Goals, Policies and Implementing Actions

Goal 1.	**To minimize risks to lives and property due to seismic and geologic hazards.**

Policies

P1. To the extent possible, projects should be designed to accommodate seismic shaking and should be sited away from areas subject to hazards induced by seismic shaking (landsliding, liquefaction, lurking, etc.) where design measures to mitigate the hazards will be uneconomic or will not achieve a satisfactory degree of risk reduction. (Source: Seismic Safety and Safety Element, pg. 6)

P2. Structures should be located at an adequate distance away from active fault traces, such that surface faulting is not an unreasonable hazard. (Source: Seismic Safety and Safety Element, pg. 6)

P3. Aspects of all development in hillside areas, including grading, vegetation removal and drainage, should be carefully controlled in order to minimize erosion, disruption to natural slope stability, and landslide hazards. (Source: Seismic Safety and Safety Element, pg. 6)

P4. Within areas of demonstrated or potential slope instability, development should be undertaken with caution and only after existing geological and soil conditions are known and considered. In areas subject to possible widespread major landsliding, only very low density development should be permitted, consistent with site investigations; grading in these areas should be restricted to minimal amounts required to provide access. (Source: Seismic Safety and Safety Element, pg. 7)

P5. All existing structures or features of structures which are hazardous in terms of damage, threat to life or loss of critical and essential function in the event of an earthquake should be, to the extent feasible, brought into conformance with applicable seismic and related safety (fire, toxic materials storage and use) standards through rehabilitation, reconstruction, demolition, or the reduction in occupancy levels or change in use. (Source: Seismic Safety and Safety Element, pg. 7, with a minor revision)

P6. The County shall not approve new development in areas with potential for seismic and geologic hazards unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific

analysis. The County shall review new development proposals in terms of the risk caused by seismic and geologic activity. (Source: ECAP, pg. 74)

P7. The County, prior to approving new development, shall evaluate the degree to which the development could result in loss of lives or property, both within the development and beyond its boundaries, in the event of a natural disaster**.** (Source: ECAP, pg. 74)

P8. The County shall ensure that new major public facilities, including emergency response facilities (e.g., hospitals and fire stations), and water storage, wastewater treatment and communications facilities, are sited in areas of low geologic risk. (Source: ECAP, pg. 74)

P9. Site specific geologic hazard assessments, conducted by a licensed geologist[21], shall be completed prior to development approval in areas with landslide and liquefaction hazards as indicated in Figures S-2 and S-4 and for development proposals submitted in Alquist-Priolo Zones as indicated in Figure S-1, hazards to be mapped include:

- Seismic features
- Landslide potential
- Liquefaction potential

Mitigation measures needed to reduce the risk to life and property from earthquake induced hazards should be included. (Source: Eden Area Plan, pg. 8-11)

P10. Buildings shall be designed and constructed to withstand ground shaking forces of a minor earthquake (1-4 magnitude) without damage, of a moderate (5 magnitude) earthquake without structural damage, and of a major earthquake (6-8 magnitude) without collapse of the structure. The County shall require that critical facilities and structures (e.g. hospitals, emergency operations centers) be designed and constructed to remain standing and functional following an earthquake. (Source: ECAP, pg. 75)

[21] In staff correspondence dated July 25, 2012, John Rogers of the Public Works Agency provided the following clarification pertaining to this policy "Soils studies within areas of earthquake-induced landslide and liquefaction are not required to be performed by a licensed geologist. The rule is that any portion of the study that is defined as civil engineering should be conducted by a geotechnical engineer, and that any portion classified as the practice of geology should be conducted by an engineering geologist or a geologist. Most soils studies are performed by geotechnical engineers. Geologists typically perform fault zone studies."

P11. All construction in unincorporated areas shall conform to the Alameda County Building Ordinance, which specifies requirements for the structural design of foundations and other building elements within seismic hazard areas.

P12. To the extent feasible, major infrastructure including transportation, pipelines, and water and natural gas mains, shall be designed to avoid or minimize crossings of active fault traces and to accommodate fault displacement without major damage that could result in long-term service disruptions. (Source: Eden Area Plan, pg. 8-12)

P13. The County shall encourage the retrofitting of existing structures and other seismically unsafe buildings and structures to withstand earthquake ground-shaking. (Source: Eden Area Plan, pg. 8-12)

P14. In order to minimize off-site impacts of hillside development, new construction on landslide-prone or potentially unstable slopes shall be required to implement drainage and erosion control provisions to avoid slope failure and mitigate potential hazards. (Source: Eden Area Plan, pg. 8-12)

Actions

A1. Require all new construction to meet the most current, applicable, lateral force requirements. (Source: Seismic Safety and Safety Element, pg. 6)

A2. Require applications for development within Alquist-Priolo Study Zones to include geological data that the subject property is not traversed by an active or potentially active fault, or that an adequate setback can be maintained between the fault trace and the proposed new construction. (Source: Seismic Safety and Safety Element, pg. 6)

A3. Require sites to be developed in accordance with recommendations contained in the soil and geologic investigations reports. (Source: Seismic Safety and Safety Element, pg. 6)

A4. Establish standards for areas previously in Alquist-Priolo Study Zones, and eliminated in the last update. (Source: Seismic Safety and Safety Element, pg. 6)

A5. Regulate, with collaboration from utility owners, the extension of utility lines in fault zones. (Source: Seismic Safety and Safety Element, pg. 6, with minor revisions)

A6. Establish (with collaboration from utility owners) and enforce design standards for transportation facilities and underground utility lines to be located in fault zones. (Source: Seismic Safety and Safety Element, pg. 6)

A7. Require soils and/or geologic reports for development proposed in areas of erodible soils and potential slope instability. (Source: Seismic Safety and Safety Element, pg. 7)

A8. Pursue programs to identify and correct existing structural hazards, with priority given to hazards in critical, essential and high occupancy structures and in structures built prior to the enactment of applicable local or state earthquake design standards. (Source: Seismic Safety and Safety Element, pg. 7)

A9. Support regional or statewide programs providing funding or technical assistance to local governments to allow identification of existing structural hazards in private development and providing assistance to public and private sectors to facilitate and to minimize the social and economic costs of hazards abatement. (Source: Seismic Safety and Safety Element, pg. 7)

A10. Continue to require the upgrading of buildings and facilities to achieve compliance with current earthquake bracing requirements as a condition of granting building permits for major additions and repairs. (Source: Seismic Safety and Safety Element, pg. 7)

A11. Continue, and as required, expand programs to provide the public information regarding seismic hazards and related structural hazards. (Source: Seismic Safety and Safety Element, pg. 7)

A12. Require geotechnical studies prior to development approval in geologic and/or seismic hazard areas as identified by future studies by federal, state, and regional agencies. Require or undertake comprehensive geologic and engineering studies for critical structures regardless of location. (Source: Castro Valley Plan, pg. 10-30)

A13. Adopt and amend as needed the most current version of the California Building Code (CBC) to ensure that new construction and renovation projects incorporate Earthquake-resistant design and materials that meet or exceed the current seismic engineering standards of the CBC. (Source: Castro Valley Plan, pg. 10-30, with minor revision)

A14. Periodically update detailed guidelines for preparation of site-specific geologic hazard assessments. These guidelines shall be prepared in consultation with the County Building Official, County Engineer, County Counsel and the County Risk Manager and shall ensure that site-specific assessments for development requiring discretionary permits are prepared according to consistent criteria. (Source: Eden Area Plan, pg. 8-13, with revisions)

A15. Develop and implement an earthquake retrofit plan to reduce hazards from earthquakes. The plan should identify and tally the seismically unsafe buildings and structures, including unreinforced masonry, unreinforced concrete and soft-story buildings, and require inspection for these structures. It should also identify sources of funding to help reconstruct or replace inadequate structures and assist homeowners with earthquake retrofitting. (Source: Eden Area Plan, pg. 8-13)

A16. On sites with slopes greater than 30 percent, require all development to be clustered outside of the 30 percent slope area. (Source: Castro Valley Plan, pg. 10-31) With the exception that development[22] upon any area outside of the Urban Growth Boundary where the slope exceeds 25% shall not be permitted. (Source: ECAP, pg. 74)

A17. Aspects of all development in hillside areas, including grading, vegetation removal and drainage, should be carefully controlled in order to minimize erosion, disruption to natural slope stability, and landslide hazards. The County's development standards and guidelines, permit application review process, Section 15.08.240 of its Building Ordinance, the Grading Erosion and Sediment Control Ordinance (Chapter 15.36 of the Alameda County General Ordinance Code), the Stormwater Management and Discharge Control Ordinance (Chapter 13.08), and Subdivision Ordinance (Title 16) shall serve to implement this policy.

3.0 FIRE HAZARDS

3.1. Fire Related Hazards

Fire hazards exist in both developed and undeveloped areas. Those occurring in developed areas typically include buildings, rubbish, automobiles, and grass fires on vacant lots. Those in undeveloped areas often include large brush and grass fires. Alameda County is subject to the threat from urban fires, and especially wildland fires, due to its hilly terrain, weather conditions, and the nature of its plant coverage. Due to the intensity of development, the number of the potentially affected populations, and the difficulties of containment, the County must also devote major resources to controlling potential fire hazards in its urban areas. In order to quantify this potential risk, California Department of Forestry (CDF)

[22] Development, as defined by the "Save Open Space and Agricultural Lands" initiative, or commonly referred to as Measure D, is the placement or erection of any solid material or structure; construction, reconstruction or alteration of any structure; change in the density or intensity of any use of land, including any division of land; grading, removing, extraction or deposition of any materials; and disposal of any waste.

has developed a Fire Hazard Severity Scale which utilizes three criteria in order to evaluate and designate potential fire hazards in wildland areas. The criteria are fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents) and topography (degree of slope). A map based upon this data has been included as Figure S-5.

3.2. Provision of Fire Services

The Alameda County Fire Department (ACFD)[23] is responsible for providing emergency fire and medical response, as well as fire prevention services, to all residents of the unincorporated areas of Alameda County, exclusive of the Fairview area. In addition, fire and emergency services are provided under contractual agreements with the cities of Dublin and San Leandro, and the U.C. Lawrence Berkeley National Laboratory. The Department's total service area encompasses approximately 475 square miles and has a daytime population of 266,000. The area contains a number of major roadways, highways, and interstates that carry thousands of private and commercial vehicles on a daily basis; large suburban and commercial centers; agricultural and wildland areas; and lakes and marinas. The geography and demography of the unincorporated area excluding Fairview is served by nine stations, encompasses 431 square miles with a population of126,397 and poses significant operational challenges. The eastern and southern areas include large portions of wildland, grazing land, and rural farmlands. The majority of the population is centered in the western area which is heavily urbanized with a mix of residential, commercial, and light industrial. The Department staffs two stations that serve two sites of the Lawrence Livermore National Laboratory. In the East County, the Department has a contract with the federal Veteran's Administration to provide service to its medical facility. First responder paramedic services are available on a 24-hour per day, 365 day per year basis throughout the entire ACFD service area. The Department also has contractual agreements with a number of other agencies including the cities of Pleasanton and Hayward to optimize service delivery to unincorporated island areas of the County. The Department is responsible for the administration and operation of the Alameda County Regional Emergency Communications Center (ACRECC), which dispatches over 62,000 EMS and fire calls annually. The dispatch center provides dispatch and communication center services for the Alameda County Fire Department, the Alameda County Emergency Medical Services Agency, US Army Camp Parks, and the cities of Alameda, Fremont and Union City. The goal of the ACRECC is to enhance the regional dispatch and communication system through the consolidation of fire and medical dispatch.

The California Department of Forestry is responsible for fire prevention and suppression in their "state responsibility areas". Protection against structural and wildland fire hazards is also provided to

[23] This information was obtained from the ACFD 2008 Annual Report http://www.acgov.org/fire/documents/annual-report-2008.pdf

unincorporated parts of the County by contract. These contract areas are commonly referred to as "local responsibility areas".

The ACFD has established several mutual aid agreements with a variety of agencies to ensure a high level of fire and medical services throughout the unincorporated areas in the event of a local or regional disaster. Currently, aid agreements exist with the U.C. Berkeley Lawrence National Laboratory, the City of Oakland, the San Ramon Valley Fire Protection District and the Livermore-Pleasanton Fire Department. The ACFD agreement with the City of Oakland includes a mutual aid response to cover the southern Oakland Hills area, and a shared automatic agreement for Interstates 580, 880, and 680. All fire departments within Alameda County share a countywide mutual aid agreement and are a part of the State Master Mutual Aid Plan.[24]

3.3. Development Standards to Mitigate Fire Hazards

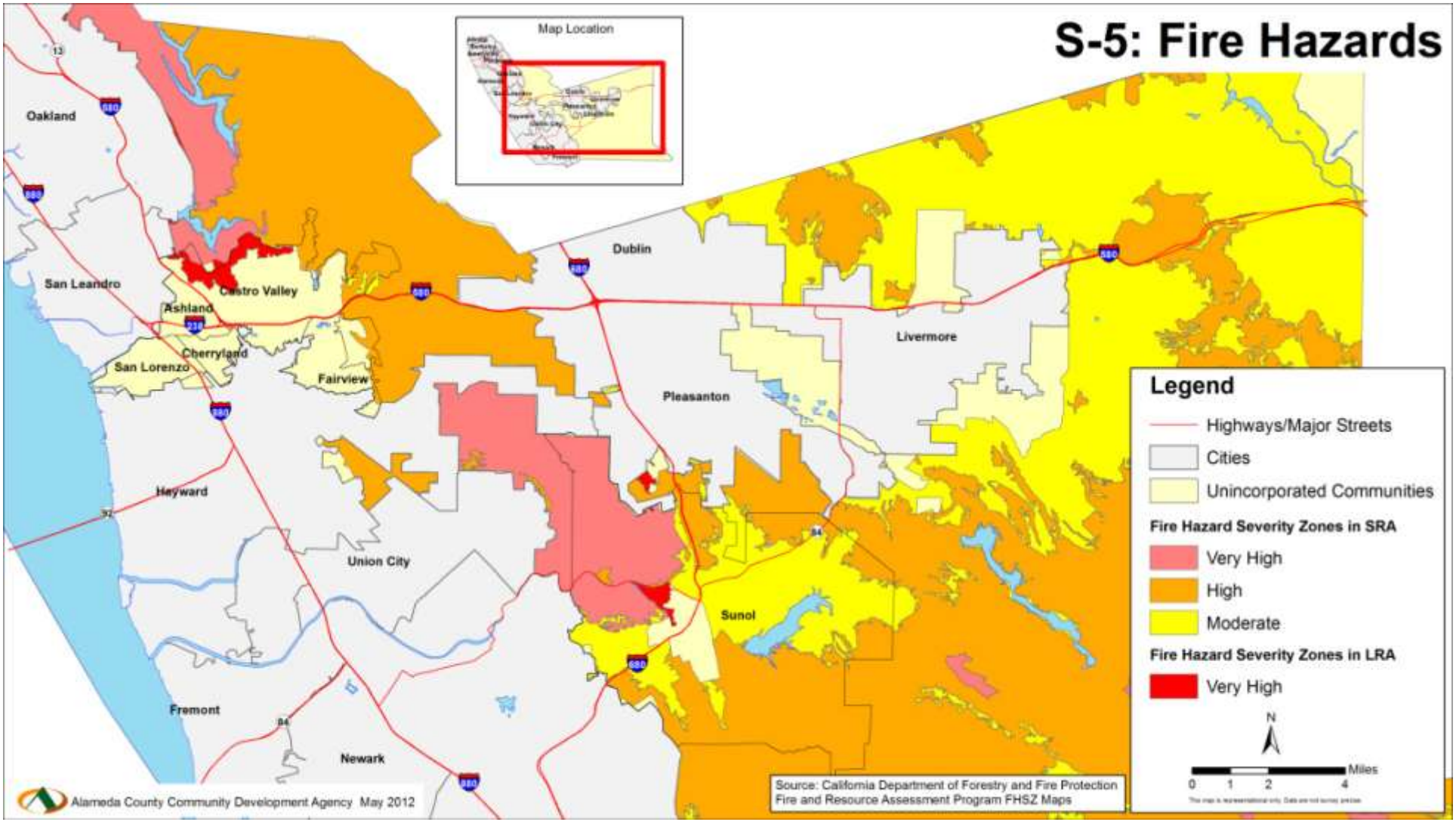
The Alameda County Ordinance Code

The Uniform Fire Code (Section 6.04 of the County Ordinance Code) and the Building Code (Title 15) form the basis of the County's fire prevention standards. These codes call for the installation, maintenance, and ongoing inspection of fire protection systems under the direction of the local fire chief. In addition, the Fire Code authorizes the Fire Chief to specify water supply and road design standards (such as the number of roads required for access to the site, the road width, and weight capacity). Under Section 16.20.020(G) of the Subdivision Ordinance (Title 16), the subdivider or developer must install water mains, fire hydrants, and fire appurtenances to supply water for fire suppression in conformance with district standards.

The California Environmental Quality Act (CEQA)

Under CEQA, a project sponsor must declare if the project would, "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." Projects that would result in increased wildland fire risk should develop appropriate alternatives and mitigations that would prevent or reduce threats from wildland fires.

[24] Excerpted from the Eden Area General Plan, page 5-12


S-5: Fire Hazards
Map Location
Oakland
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Fremont
Newark
Dublin
Pleasanton
Livermore
Sunol
Legend
Highways/Major Streets
Cities
Unincorporated Communities
Fire Hazard Severity Zones in SRA
Very High
High
Moderate
Fire Hazard Severity Zones in LRA
Very High
N
Miles
0 1 2 4
Source: California Department of Forestry and Fire Protection
Fire and Resource Assessment Program FHSZ Maps
Alameda County Community Development Agency May 2012

All new text has been underlined and italicized. New maps are marked with an *.

3.4. Goals, Policies and Implementing Actions

Goal 2.	**To reduce the risk of urban and wildland fire hazards.**

Policies

P1. Urban and rural development and intensive recreational facilities should be discouraged in hill open space areas lacking an adequate water supply or nearby available fire protection facilities. (Source: Seismic Safety and Safety Element, pg. 7)

P2. Hill area development, and particularly that adjoining heavily vegetated open space area, should incorporate careful site design, use of fire retardant building materials and landscaping, development and maintenance of fuel breaks and vegetation management programs, and provisions to limit public access to open space areas in order to minimize wildland fire hazards. (Source: Seismic Safety and Safety Element, pg. 7)

P3. Development should generally be discouraged in areas of high wildland fire hazard where vegetation management programs, including the creation and maintenance of fuel breaks to separate urban uses would result in unacceptable impacts on open space, scenic and ecological conditions. (Source: Seismic Safety and Safety Element, pg. 7)

P4. All urban and rural development, existing and proposed, should be provided with adequate water supply and fire protection facilities and services. Facilities serving hill area development should be adequate to provide both structural and wildland fire protection. The primary responsibility falls upon the owner and the developer. (Source: Seismic Safety and Safety Element, pg. 8)

P5. Structures, features of structures, or uses which present an unacceptable risk of fire should be brought into conformance with applicable fire safety standards. (Source: Seismic Safety and Safety Element, pg. 8)

P6. Plan new public and private buildings to minimize the risk of fires and identify measures to reduce fire hazards to persons and property in all existing development. (Source: Castro Valley Plan, pg. 9-13)

P7. The County shall adhere to the provisions of the *Alameda County Fire Protection Master Plan* and *Fire Hazard Mitigation Plan.* (Source: ECAP, pg. 76)

P8. The County shall limit residential development to very low densities in high fire hazard zones identified in Figure 6. (Source: ECAP, pg. 76)

P9. The County shall require all new homes in rural residential areas that are located in “high” and “very high” fire hazard areas to be sited and designed to minimize risks to life and property. (Source: ECAP, pg. 76)

P10. The County shall require the use of fire resistant building materials, fire resistant landscaping and, and adequate clearance around structures in “high” and “very high” fire hazard areas. (Source: ECAP, pg. 76)

P11. The County shall require that open space within developed areas be designed and maintained to minimize fire hazards and ensure compatibility between development and any significant biological resources. (Source: ECAP, pg. 19)

P12. The County shall refer development applications to the Alameda County Fire Department, or the local Fire District for review and recommendation. (Source: ECAP, pg. 76)

P13. The County shall support fire service agencies in maintaining and improving existing Insurance Safety Organization (ISO) ratings. (Source: ECAP, pg. 76)

Actions

A1. Limit or prohibit development and activities in areas lacking adequate water and firefighting facilities. (Source: Seismic Safety and Safety Element, pg. 7)

A2. Enforce design standards and guidelines through the site development, planned development, and subdivision review process. (Source: Seismic Safety and Safety Element, pg. 7)

A3. Require environmental impact assessment for development proposals in areas of severe fire hazard. (Source: Seismic Safety and Safety Element, pg. 8)

A4. Enforce, and as required, revise development standards. (Source: Seismic Safety and Safety Element, pg. 8)

A5. Enforce applicable provisions of the Alameda County Subdivision and Building Ordinances .

A6. Encourage fire safety public education and information programs. (Source: Seismic Safety and Safety Element, pg. 8)

A7. The County shall maintain a current map of areas subject to wildland fires.

A8. Establish clearly in County zoning and other ordinances that the Fire Department has the authority to recommend denial or modification to proposed development projects, particularly for projects proposed within “high” or “very high” fire zone areas as identified in Figure 5, Fire Hazards, to reduce the risk of bodily harm, loss of life, or severe property damage and environmental degradation. (Source: Castro Valley Plan, pg. 10-7)

A9. Establish clearly in County zoning and other ordinances that the Fire Department may require the use of appropriate fire resistant building materials, installation of fire sprinklers, and/or vegetation management, and that such requirements shall be based on a property’s access, slope, water pressure, and proximity to wildland areas. Such requirements shall apply particularly to projects proposed within Very High Fire Zone Areas as identified in Figure 5, Fire Hazards, but may also apply to other properties where access for emergency vehicles does not fully comply with adopted standards. (Source: Castro Valley Plan, pg. 10-7)

A10. Establish an interdepartmental review process for proposed projects where Fire, Public Works, Planning, and other County Departments consult and establish reasonable and consistent requirements for streets, driveways, and emergency access prior to zoning approval. (Source: Castro Valley Plan, pg. 10-7)

A11. Revise the review process for any project that proposes an increase in density so that any inadequacy of water pressure for fire hydrants and fire flows for fire suppression purposes is identified early in the development review process. Also identify if the roadway serving the project is deficient in terms of access for emergency vehicles. Identify any access improvements that may be required, for example roadway widening along property frontage, or additional off-street parking. (Source: Castro Valley Plan, pg. 10-8)

A12. Upgrade and standardize fire hydrants to accept equipment from neighboring fire districts so that the County can accept assistance through a mutual aid request during an emergency. (Source: Castro Valley Plan, pg. 10-8)

A13. Enforce the requirement that Home Owners' Associations in Planned Unit Development areas are responsible for vegetation management by establishing a regular review schedule for areas subject to this requirement. (Source: Castro Valley Plan, pg. 10-8)

A14. Revise the County's Integrated Vegetation Management Program to require private property owners to maintain the vegetation on their property in a condition that will not contribute to the spread of a fire. Requirements for private property owners could include, but need not be limited to, the following:

- Maintain a 30-foot defensible space around all buildings and structures;
- Remove all portions of trees within 10 feet of chimneys and stovepipe outlets;
- Remove materials or plants that may act as a fuel or a conveyance of fire (such as dead/dying wood on trees adjacent to/overhanging structures, leaves, pine needles, etc. on rooftops or elsewhere on the property); and
- Install spark arrester in chimney and or stovepipe outlets. (Source: Castro Valley Plan, pg. 10-9)

A15. Consider establishing and funding an enforcement district for fire hazard areas and wildland, intermix and interface areas; and establish an inspection period to be conducted annually for properties located in these areas. Mail notices to the residents in these areas notifying them of the inspection period, listing the standards for vegetation management on their properties, and suggesting tips for compliance. Additional funding would be required, such as the formation of an assessment district or other means. (Source: Castro Valley Plan, pg. 10-9)

A16. In hillside areas where street widths are substantially below the minimum 20-foot width standard required for emergency access, one or more of the following requirements should be imposed to ensure adequate emergency access:

- Sprinklers;
- Turnouts along the paved roadway;
- Additional on-site parking;
- Increased roadway width along the front of the property; or

- Parking Restrictions. (Source: Castro Valley Plan, pg. 10-10)

A17. Establish consistent standards for private streets depending on the number of units that the street will serve the number of required parking spaces per unit, and reasonable access requirements and operational needs of emergency access vehicles and garbage trucks. Standards should include:

- Minimum paved roadway width requirements (i.e., 20 feet for roads serving five or more units or when part of required fire apparatus access, and 12 feet for roads serving between two and five units that is not part of required fire apparatus access);
- Turnarounds;
- Landscaping;
- Red curbs and signage for no parking zones;
- Sidewalks; and
- Parking standards. (Source: Castro Valley Plan, pg. 10-10)

A18. The County shall prepare a comprehensive wildland fire prevention program including fuelbreaks, brush management, controlled burning, and access for fire suppression equipment. (Source: ECAP, pg. 77)

A19. The County shall prepare a disaster response plan for buildings exceeding 3 stories (or 30 feet, whichever is less), public assembly facilities, and facilities housing dependent populations. (Source: ECAP, pg. 77)

A20. The County shall develop wildland fire regulations including site criteria building setbacks, construction standards, minimum road widths, maximum road grades, and evacuation routes. (Source: ECAP, pg. 76)

A21. The County shall adopt by ordinance the "Wildland Fire Safety Requirements" contained in the Alameda County Fire Protection Master Plan. (Source: ECAP, pg. 76)

A22. The County shall work with the California Department of Forestry and Fire Protection to designate "very high fire hazard severity zones" in conformance with AB 337 (1992). The

County shall ensure that all zones designated as such meet the standards and requirements contained in this legislation. (Source: ECAP, pg. 77)

4.0 FLOOD HAZARDS

4.1. Flood Related Hazards

A flood plain is any area that is susceptible to being inundated by water from any source. Mostly, this is the area adjacent to a river, creek, lake, stream, or other waterway that is subject to flooding when there is a significant run-off event. When development brings pavement, roofs, and other hard surfaces, rainfall percolates less into the ground. "Uncontrolled" development can cause increases in flooding, but Alameda County's current development regulations will typically require on-site detention of runoff from a 100-year storm."[25] Runoff to the nearby river or creek increases, and the development within the flood plain can be subject to flooding. Hazards often are the result of above average rainfall over a short duration, resulting in increased runoff and flooding along area creeks and areas with poor drainage. Flood prone areas are generally described as areas that have a one in a hundred (or 1%) chance of being inundated in any given year. Areas potentially subject to flooding from a 100-year event include various low-lying areas and areas adjacent to creek channels as mapped by the Federal Emergency Management Agency (FEMA). The County Floodplain Management Ordinance recognizes the following types of floodplains[26]:

- The Special Flood Hazard Areas (SFHA's) shown on the FEMA Flood Insurance Rate Map (FIRM).
- Any outward adjustment of the SFHA's caused by errors in mapping.
- Any area outside of a SFHA or an adjusted SFHA that has actually been flooded.
- The County floodplain regulations are based upon the "design flood," which is always more severe (by a foot or more in depth) than the 100-year or base flood mapped by FEMA. Alameda County will apply the floodplain design regulations to any area theoretically wetted by the design flood.

[25] Text derived from comments received from John Rogers, Alameda County Public Works Agency, Land Development Division, on October 2, 2013,
26 Ibid.

- The County can also apply setbacks to certain floodplain areas where it establishes building limit lines outside of the floodplain.

In conjunction with FEMA's effort, flood elevations and limits have been determined for the affected areas.

A map of flood hazards is provided in Figure S-6. Figure S-7 is a map of 100, 200 and 500 year floodplains based upon best available data from the Department of Water Resources (DWR). Figure S-7 shows not only those areas within the FEMA designated 100 and 500 year floodplains, but also includes additional data from the DWR and United States Army Corp of Engineers (USACE).

Flooding occurring within the boundaries of the Planning Area is typically caused by heavy rainfall and runoff volumes that exceed the capacity of existing storm drainage and flood control systems. The following watercourses pose a potential flooding risk in unincorporated Alameda County:

- Alameda Creek
- Altamont Creek
- Arroyo De La Laguna
- Arroyo Del Valle
- Arroyo Las Positas
- Arroyo Las Positas (relocated)
- Arroyo Mocho
- Arroyo Seco
- Bockman Canal
- Castro Creek (Line J)
- Castro Creek (Line I)
- Cayetano Creek
- Chabot Creek (Line F)
- Chabot Creek (Line G)
- Collier Canyon Creek
- Crow Creek
- Cull Creek
- Estudillo Canal
- Palomares Creek
- San Antonio Reservoir and Creek
- San Lorenzo Creek
- Sulphur Creek
- Tassajara Creek
- Line N, San Lorenzo

Throughout the urbanized parts of the County, flood hazards have been greatly reduced through the efforts of the Alameda County Flood Control and Water Conservation District (ACFCWCD) and the Zone 7 Water Agency. Each of these entities designs, constructs and maintains flood protection facilities to meet existing and projected community needs. Their systems are adequate for most situations.

Historical data on flooding, areas that are vulnerable to flooding after wildfires, and information pertaining to sites that have been repeatedly damaged by flooding is available in the Alameda County Local Multi-Hazard Mitigation Plan.

4.2. Federal, State and Local Entities Responsible for Flood Protection

Federal Emergency Management Agency (FEMA)

FEMA is the Federal agency that oversees floodplains and manages the national flood insurance program. FEMA prepares Flood Insurance Rate Maps (FIRM) for communities participating in the Federal

flood insurance program. The FIRM maps indicate the regulatory floodplain to assist communities with land use and floodplain management decisions so that the requirements of the National Flood Insurance Program (NFIP) are met in the event of damaging floods. Alameda County participates in the Federal flood insurance program and must meet FEMA standards for flood protection facilities and floodplain management.

U.S. Army Corps of Engineers (USACE)

The USACE is the Federal agency that studies, constructs, and operates regional-scale flood protection systems in partnership with State and local agencies. Specific agreements between the USACE and its State and local partners used to define shared financial responsibilities and regulations. The Sacramento District of the USACE is preparing a Delta Islands and Levees feasibility Study. According to the USACE, "The Delta Islands and Levees Feasibility Study (Delta Study) is the Corps' mechanism to participate in a cost-shared solution to address ecosystem restoration, flood risk management, and related water resources in the Delta and Suisun Marsh area."[27] The study area includes a portion of the Mountain House area of Alameda County.

California Department of Water Resources, Division of Floodplain Management (DWR)

DWR is the State agency that studies, constructs, and operates regional-scale flood protection systems, in partnership with Federal and local agencies. DWR also provides technical, financial, and emergency response assistance to local agencies related to flooding.

Central Valley Flood Protection Board (formerly Reclamation Board)

In 2007, Assembly Bill 5 (AB 5) was adopted, which renamed the Reclamation Board as the Central Valley Flood Protection Board (CVFPB). AB 5 reconfigured the membership of the Board, and required the CVFPB to be independent of DWR. Senate Bill 17 (SB 17) was also adopted in 2007 and contained similar provisions to AB 5, renaming and reorganizing the Reclamation Board as the CVFPB and directing DWR to prepare and the CVFPB to adopt a State Plan of Flood Control. The mission of the CVFPB is to control flooding along the Sacramento and San Joaquin Rivers in cooperation with various agencies and to maintain the integrity of the existing flood control system and designated floodways via authority over encroachment permits.

[27] *A fact sheet on the Delta Islands and Levees Feasibility Study may be obtained here: http://www.spk.usace.army.mil/Portals/12/documents/civil_works/Delta/DILFS/FactSheet_DeltaStudy_130131.pdf .*

California Building Standards Commission (BSC)

The BSC's mission is to develop practical and sensible building standards and administrative regulations that implement or enforce those standards. All of the basic floodplain design standards for buildings and structures are now included in the various California building standards (i.e. Building Code, Residential Code, and Plumbing Code).

Alameda County

Within Alameda County, the Alameda County Flood Control and Water Conservation District (ACFCWCD), the Zone 7 Water Agency and Public Works Agency provide regulatory guidance and oversee the flood control system within unincorporated Alameda County. In addition, the Planning Department and PWA, Building Inspections Division oversees land use and development.

4.3. Assembly Bill 162 (Wolk)

Pursuant to Assembly Bill (AB) 162 (2007), the California Department of Water Resources (DWR) and Central Valley Flood Protection Board (CVFPB) has prepared and adopted a Central Valley Flood Protection Plan (CVFPP). The northeast corner of Alameda County is included within the Systemwide Planning Area (SPA) of the CVFPP; therefore, the policies contained therein shall apply to those lands within the plan's boundaries. The SPA includes lands subject to flooding under the current facilities and operation of the Sacramento-San Joaquin River Flood Management System (California Water Code Sections 9611, 9614(d,e)). Figure S-8 is a map of the SPA as provided in the CVFPP. Plan documents may be accessed here: http://wwwdwr.water.ca.gov/cvfmp/documents.cfm.

AB 162 also establishes certain flood protection requirements for local land use decision-making based on the CVFPP. This law sets a higher standard for flood protection for the Sacramento-San Joaquin Valley area, which covers the entire Delta region. It sets an urban level of flood protection necessary to withstand a 1 in 200 chance of occurring in any given year (200-year flood) for areas developed or planned to have a population of at least 10,000. For areas with a population less than 10,000 residents, no new developments may be approved unless the area has made "adequate progress" in achieving 100 year flood protection.

Upon adoption of the CVFPP, Alameda County must incorporate CVFPP measures into its General Plan and Zoning Ordinance. On the effective date of those amendments, the County is prohibited from entering into a development agreement or approving a subdivision map within an identified flood hazard

zone unless certain findings are made with substantial evidence. The County will include appropriate CVFPP measures within the comprehensive Zoning Ordinance update.

All of the land identified under the CVFPP lies within the boundaries of the East County Area Plan (ECAP) as amended by Measure D. Under ECAP, the lands have the following general plan designations, Large Parcel Agriculture, Water Management, Parklands, and Major Public Facilities. The Major Public Facilities designation is associated with the California Aqueduct and Clifton Court Forebay. The Parklands designation includes the Bethany Reservoir. The Water Management designation is associated with portions of the California Aqueduct. The remaining land has the Large Parcel Agriculture designation.

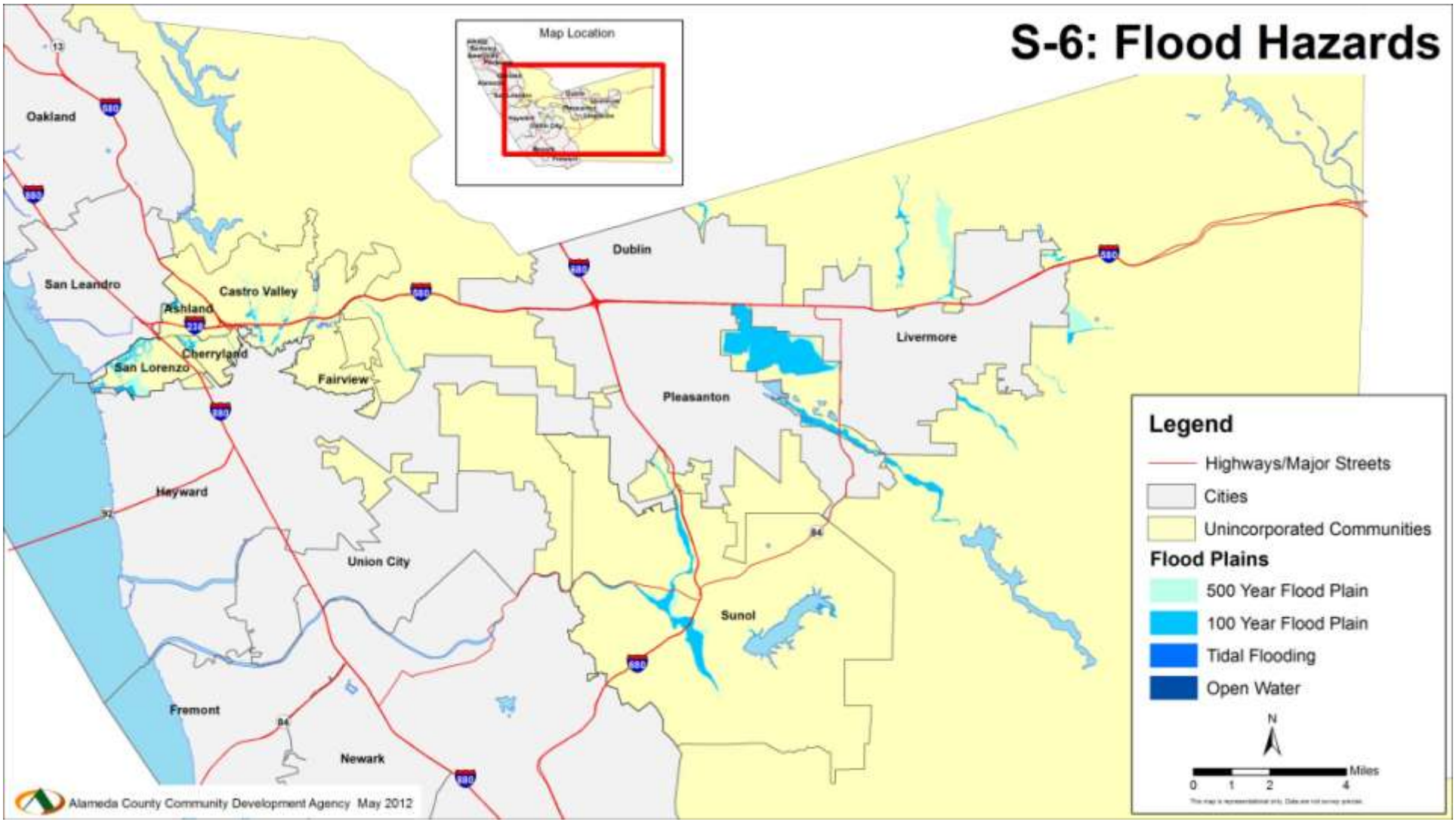
ECAP policies greatly limit development within these areas. Privately owned parcels must be a minimum of 100 acres in size. They are also subject to a maximum floor area ratio of 0.01, and residential and residential accessory structures shall not exceed 12,000 square feet in floor area.

4.4. Senate Bill 5 (Machado)

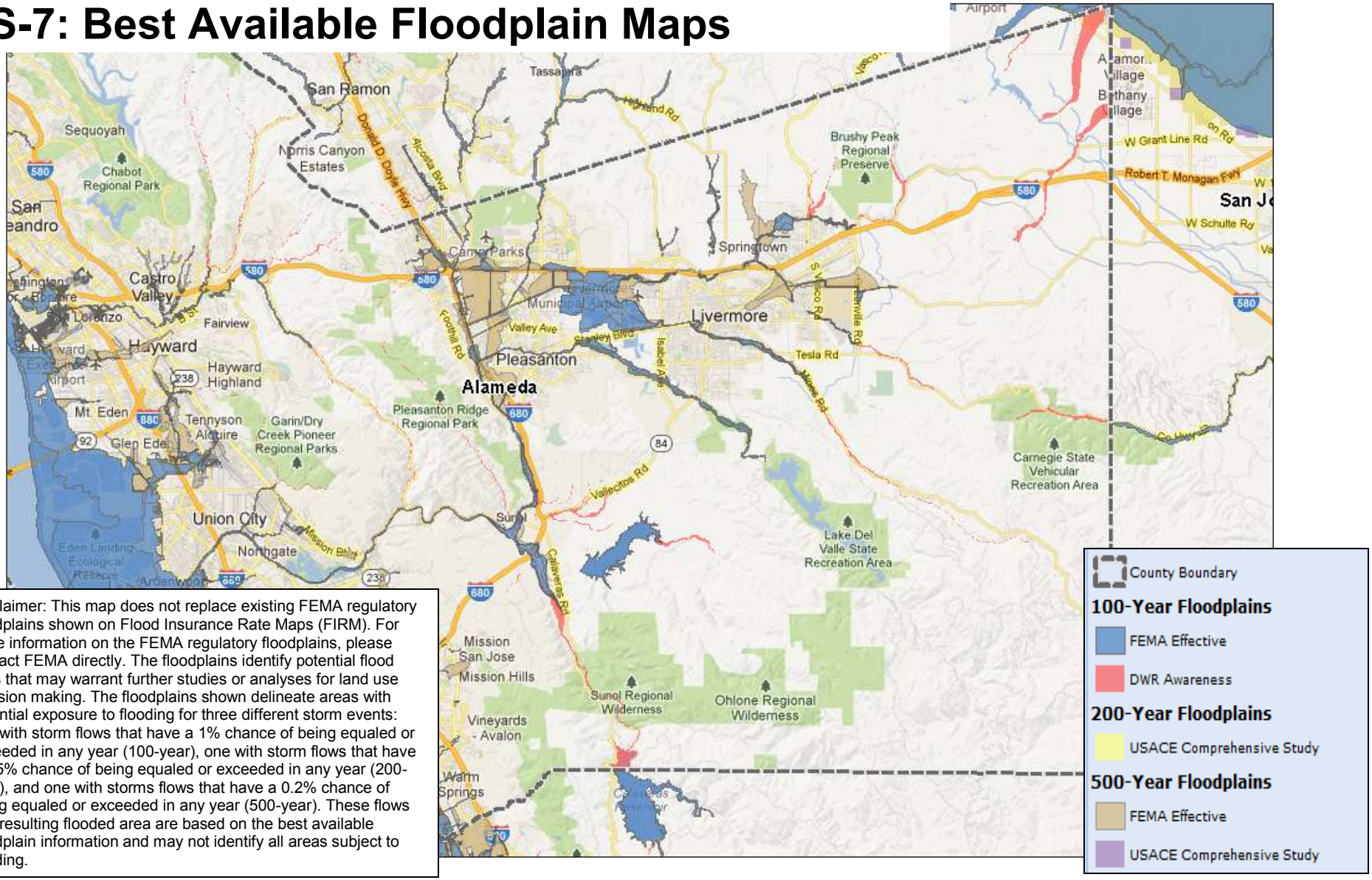
This bill requires each city and county within the Sacramento-San Joaquin Valley, within 24 months of the adoption of the CVFPP by the CVFPB (not later than July 1, 2012) is to amend its general plan to include data and analysis contained in that flood protection plan; goals and policies for the protection of lives and property that will reduce the risk of flood damage; and related feasible implementation measures. Each city and county, within 36 months of the adoption of the flood protection plan, but not more than 12 months after the amendment of the general plan, is to amend its zoning ordinance so that it is consistent with the general plan, as amended.

In addition, the bill mandates that DWR develop, for adoption and approval by the California Building Standards Commission, updated requirements to the California Building Standards Code for construction in areas protected by facilities of the CVFPP, where levels are anticipated to exceed 3 feet for the 200-year event.

Senate Bill 5 also prohibits cities and counties from entering into a development agreement for any property that is located within a flood hazard zone unless the city or county finds, based upon substantial evidence in the record, that the facilities of the State Plan of Flood Control or other flood management facilities protect the property to the urban level of flood protection in urban and urbanizing areas or the standard of flood protection of the FEMA National Flood Insurance Program (NFIP) in non-urbanized areas. These requirements are codified in Government Code Sections 65865.5, 65962, and 66474.5.

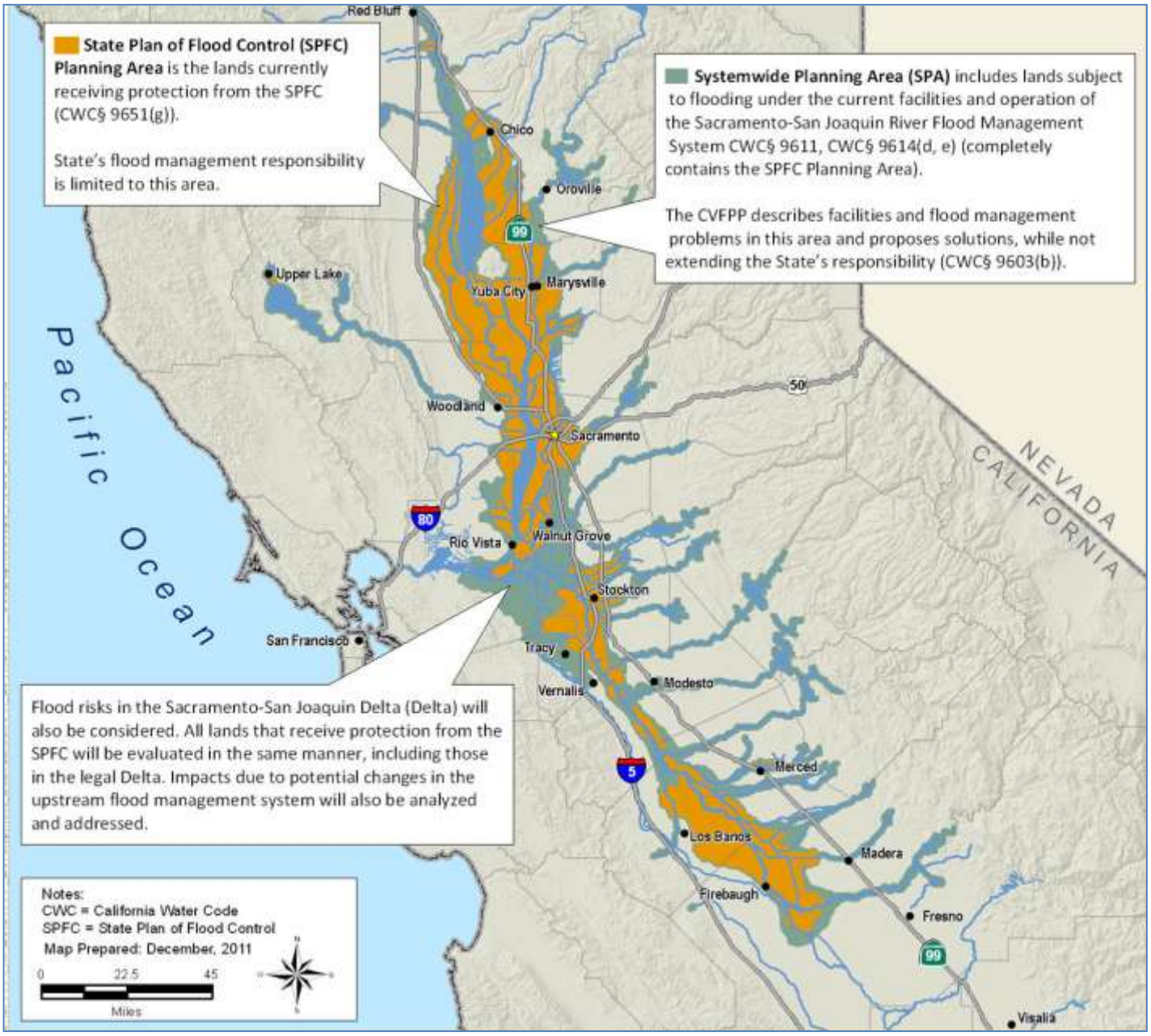

S-6: Flood Hazards
Map Location
Oakland
San Leandro
Ashland
Castro Valley
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Fremont
Newark
Dublin
Pleasanton
Livermore
Sunol
Legend
Highways/Major Streets
Cities
Unincorporated Communities
Flood Plains
500 Year Flood Plain
100 Year Flood Plain
Tidal Flooding
Open Water
N
Miles
0 1 2 4
Alameda County Community Development Agency May 2012

S-7: Best Available Floodplain Maps



Disclaimer: This map does not replace existing FEMA regulatory floodplains shown on Flood Insurance Rate Maps (FIRM). For more information on the FEMA regulatory floodplains, please contact FEMA directly. The floodplains identify potential flood risks that may warrant further studies or analyses for land use decision making. The floodplains shown delineate areas with potential exposure to flooding for three different storm events: one with storm flows that have a 1% chance of being equaled or exceeded in any year (100-year), one with storm flows that have a 0.5% chance of being equaled or exceeded in any year (200-year), and one with storms flows that have a 0.2% chance of being equaled or exceeded in any year (500-year). These flows and resulting flooded area are based on the best available floodplain information and may not identify all areas subject to flooding.

S-8: Central Valley Flood Protection Plan Map



4.5. Dam Inundation

In accordance with State law, the County has also evaluated possible flood risks arising from the failure of dams or reservoirs. Within the state of California, oversight of dams falls to the Department of Water Resources, Division of Safety of Dams (DOSD). Existing dams under DOSD jurisdiction are inspected annually to ensure adequate maintenance and to direct the dam owner to correct any known deficiencies. Regular inspections and routine maintenance of the dams substantially reduces the risk of catastrophic failure. Figure S-9 highlights those areas that within the Planning Area that might be affected by flooding in the event of a dam or reservoir failure. The depth of inundation would vary from zero in upland areas to many feet on low-lying areas and in creek channels. There are no State or local restrictions for development within dam failure inundation areas; however, the Emergency Services Act (Government Code Section 8589.5) requires that dam inundation maps be prepared to identify flood risk and that local jurisdictions prepare evacuation procedures in the event of a catastrophic dam failure.

The following table, Table S-5, lists all of the dams within or adjacent to the planning area.

Table S - 5: Dams within or Adjacent to the Planning Area[28]

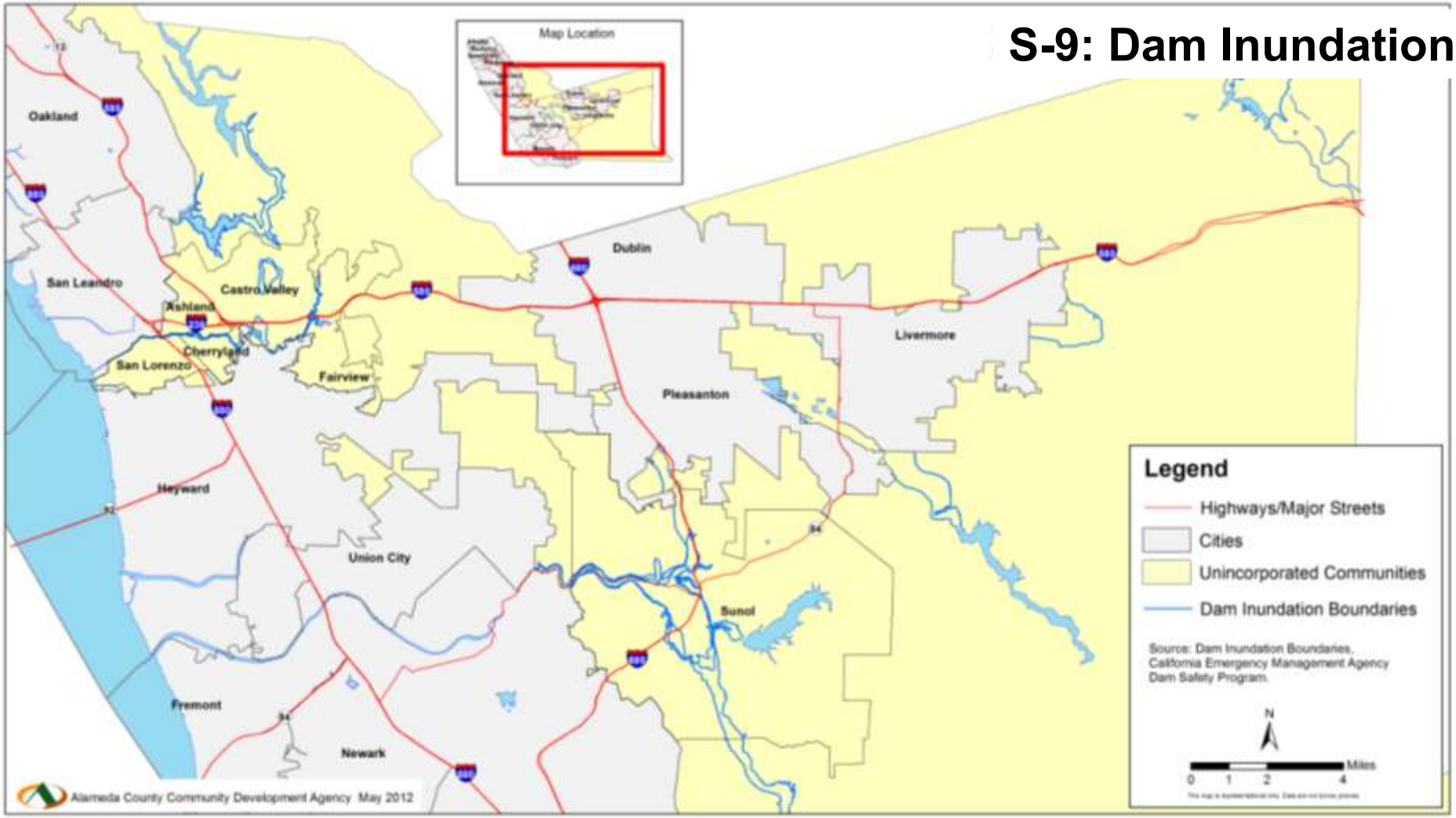
Name	Owner	Type	Capacity (acre/feet)
Almond	EBMUD	Earth	20
Bethany Forebay	CA Department of Water Resources (CADWR)	Earth	5,250
Calaveras	City/County of SF	Hydraulic Fill	100,000
Chabot	EBMUD	Hydraulic Fill	10,281
Cull Creek	ACFCWCD	Earth	310
Del Valle	CADWR	Earth	77,100
James H. Turner	City/County of SF	Earth	50,500
New Upper San Leandro	EBMUD	Earth	42,000
Patterson (1-062)	CADWR	Earth	98
San Lorenzo Creek	ACFCWCD	Earth	380
South	EBMUD	Earth	156
Ward Creek	ACFCWCD	Earth	130

In 2011, San Francisco Public Utilities Commission began construction on a replacement for the Calaveras Dam downstream from its current location. This project may result in a change to the dam

[28] CA Department of Water Resources, Division of Safety of Dams, Complete Listing of Dams within the Jurisdiction of the State of California in Alphabetically order by name of the Dam

inundation areas as indicated on the map below. The County will continue to monitor the project and, if necessary, will revise its dam inundation map.

S-9: Dam Inundation



4.6. Development Standards for Areas at Risk of Flooding

The following is a summary of development guidelines and regulations pertaining to flood hazards.

Federal Emergency Management Agency (FEMA), National Flood Insurance Program (NFIP)

The County in conjunction with other local jurisdictions participates in the FEMA sponsored National Flood Insurance Program (NFIP). The NFIP provides flood insurance to businesses and individuals in known flood hazard areas. As a participant, the County must comply with FEMAs standards for the regulation of development in special flood hazard areas and conduct floodplain management activities not only to reduce or prevent the loss of life or property, but also preserve and protect the floodplain.

The California Environmental Quality Act (CEQA)

The Act includes several provisions that address flood prevention and loss caused by floods. Through the environmental review process authorized under the Act a project must declare if it would:

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff (e.g., due to increased impervious surfaces) in a manner which would result in flooding on- or off-site (i.e. within a watershed);
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems due to changes in runoff flow rates or volumes;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows; and
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam

Projects that would result in one or more of these environmental effects would be required to consider an alternative to the particular project or to provide appropriate mitigations that either reduce or eliminate these hazards.

The Alameda County General Ordinance Code

The Alameda County Ordinance Code addresses flood hazard mitigation in the following documents:

- The Watercourse Protection Ordinance (Chapter 13.12)
- Section 15.08.230 of the Building Ordinance
- Grading Erosion and Sediment Control Ordinance (Chapter 15.36)
- Floodplain Management (Chapter 15.40)

New development within a floodplain is generally required to be at least one foot above the 100-year flood levels, or may be restricted completely within any designated floodway (i.e. the central portion of certain 100 year flows).

These documents are periodically reviewed and updated to ensure consistency with State law and/or NFIP requirements.

4.7. Goals, Policies and Implementing Actions

Goal 3.	**To reduce hazards related to flooding and inundation.**

Policies

P1. "Within flood hazard areas, all new construction of buildings, structures, and portions of buildings and structures, including substantial improvement and restoration of substantial damage to buildings and structures, shall be designed and constructed to resist the effects of flood hazards and flood loads."

P2. Surface runoff from new development shall be controlled by on-site measures including, but not limited to structural controls and restrictions regarding changes in topography, removal of vegetation, creation of impervious surfaces, and periods of construction such that the need for off-site flood and drainage control improvements is minimized and such that runoff from development will not result in downstream flood hazards. (Source: Seismic Safety and Safety Element, pg. 8)

P3. Structures shall generally be located away from shoreline areas subject to tsunami inundation, except where they can be feasibly designed to withstand the effects of inundation. (Source: Seismic Safety and Safety Element, pg. 8)

P4. Development shall only be allowed on lands within the 100-year flood zone if it will not:

- Create danger to life and property due to increased flood heights or velocities caused by excavation, fill, roads and intended use.
- Impede access of emergency vehicles during a flood.
- Create a safety hazard due to the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters at the site.
- Exacerbate costs of providing governmental services during and after flooding, including increased maintenance and repair of public utilities and facilities.
- Interfere with the existing water flow capacity of the floodway.
- Substantially increase erosion and/or sedimentation.
- Contribute to the deterioration of any watercourse or the quality of water in any body of water. (Source: Eden Area Plan, pg. 8-19)

P5. Both public and private service facilities and utilities in existing 100-year flood zones, shall be flood-proofed to a point at, or above, the base flood elevation. (Source: Eden Area Plan, pg. 8-19)

P6. The County shall prevent the construction of flood barriers within the 100-year flood zone that will divert flood water or increase flooding in other areas. (Source: Eden Area Plan, pg. 8-19)

P7. To the extent feasible, the County shall continue to improve its rating under the National Flood Insurance Program so that flood insurance premiums for residents in flood prone areas may be reduced. (Source: Eden Area Plan, pg. 8-20, with minor revision)

P8. Property owners should be informed of the National Flood Insurance Program, which is intended to reduce the financial risk from flooding.

P9. Development shall comply with applicable NPDES requirements. (Source: Eden Area Plan, pg. 8-20)

P10. The County shall work with the Alameda County Flood Control and Water Conservation District and Zone 7 Water Agency to provide for development of adequate storm drainage and flood control systems to serve existing and future development. (Source: ECAP, pg. 67, with minor revision)

P11. The County shall promote flood control measures that advance the goals of recreation, resource conservation (including water quality and soil conservation), groundwater recharge, preservation of natural riparian vegetation and habitat, and the preservation of scenic values of the county's arroyos and creeks. (Source: ECAP, pg. 67)

P12. The County shall require new development to pay their fair share of storm drainage and flood control improvements. (Source: ECAP, pg. 67)

P13. The County shall regulate new development on a case-by-case basis to ensure that project storm drainage facilities shall be designed so that peak rate flow of storm water from new development will not exceed the rate of runoff from the site in its undeveloped state. (Source: ECAP, pg. 67, with minor revision)

P14. The County shall ensure that development proposals within designated dam inundation areas are referred to the Office of Emergency Services and to appropriate local police departments for evaluation and updating of emergency response and evacuation plans. (Source: ECAP, pg. 67)

P15. All development proposals shall comply with all County ordinances and State Codes that include flood-related design requirements

P16. The County shall not approve any new development[29] on lands within the Sacramento - San Joaquin Valley (SSJV) as defined by the California Department of Water Resources unless the findings contained within Government Code Section 65865.5, 65962, or 66474.5 have been made.

[29] *Development includes all of the following: development agreements, discretionary permit, discretionary entitlement, ministerial permit for a project, or a tentative map/parcel map for a subdivision.*

Actions

A1. Enforce applicable provisions of the Building Code (Source: Seismic Safety and Safety Element, pg. 8)

A2. Require environmental assessment of project impacts. (Source: Seismic Safety and Safety Element, pg. 8)

A3. Utilize site development and planned development district review. (Source: Seismic Safety and Safety Element, pg. 8)

A4. Require studies where development is proposed in areas designated by FEMA as a having a potential flood risk and that any resulting development conform to the study findings.

A5. Ensure that all construction and development activities obtain all applicable federal, state, regional, and County permits and approvals related to grading and erosion control, stormwater management and discharge control, and watercourse protection. (Source: Castro Valley Plan, pg. 10-18)

A6. Require new development to comply with the requirements and criteria for stormwater quantity controls established in the Alameda County Hydrology and Hydraulics Criteria Summary (HHCS) to control surface runoff from new development. (Source: Castro Valley Plan, pg. 10-19)

A7. Dedicate adequate resources to ensure effective and timely monitoring and maintenance of public drainage facilities, including storm drains, to maintain adequate capacity for peak flows in the area. (Source: Castro Valley Plan, pg. 10-19)

A8. Use the Alameda County Flood Plain Management Ordinance (Chapter 15.40) and Section 15.08.230 of the Alameda County Building Code when assessing flood risk prior to project completion, as well as ongoing risk after flood control and improvement projects are implemented.

A9. Work with ACFCWCD, and other agencies and jurisdictions to conduct feasibility studies, and implement flood control improvement projects, including, but not limited to: creek restoration, regional detention facilities in existing or proposed open space areas and/or parks, dredging; existing area dams that are silted-up, dredging existing facilities for increased capacity and recreation. (Source: Castro Valley Plan, pg. 10-20)

A10. Establish design standards, guidelines and setback requirements for development on properties that abut creeks and waterways, and require the replanting and restoration of riparian vegetation as part of any discretionary permit. Implement and enforce creek setback requirements for development for properties that abut creeks in coordination with the ACFCWCD and Zone 7 Water Agency. (Source: Castro Valley Plan, pg. 10-20, with minor revision)

A11. Continue to participate in activities that prevent or reduce flood impacts to existing and future development as described under the Community Rating System program developed by FEMA's National Flood Insurance Program. (Source: Eden Area Plan, pg. 8-20)

A12. Monitor potential changes in information regarding tsunami hazards for the unincorporated area. (Source: Eden Area Plan, pg. 8-20)

A13. Review and revise Chapters 13.08 (Stormwater Management and Discharge Control), 13.12 (Watercourse Ordinance), 15.36 (Grading Erosion and Sediment Control), Title 16 (Subdivision Ordinance), and Section 15.08.230 of the Building Code as needed to minimize flood risks within the County and to comply with State and Federal flood control requirements.

A14. Amend the Zoning Ordinance as needed to comply with the Central Valley Flood Protection Plan.

CHAPTER 2: MAN MADE HAZARDS

1.0 PURPOSE AND INTENT

This chapter describes man made hazards present within unincorporated Alameda County and goals, policies and actions intended to minimize loss due to hazardous materials and aviation.

2.0 HAZARDOUS MATERIALS

2.1. Introduction

Residential, commercial and industrial activities are all potential sources of hazardous waste. Hazardous materials include those substances that may be described as toxic, infectious, ignitable, corrosive or reactive. In the urban unincorporated areas, common sources of hazardous waste are gasoline service stations, dry cleaners, automotive repair businesses, machine shops, printers and photo processors. Other sources include plant nurseries, building supply yards, hospitals and medical office buildings, paint stores, and welding shops. In most cases, these uses are confined to major traffic corridors. In the non-urbanized portion of the County hazardous waste is generated through agricultural and mining related activities.

2.2. Regulatory Oversight for the Creation, Containment and Disposal of Hazardous Waste

The production, storage, transport and disposal of hazardous waste is regulated by federal, state and local laws designed to protect human health and the environment. The various agencies that enforce these laws include, but are not limited to, the U.S. Environmental Protection Agency, the California Environmental Protection Agency, the California Department of Transportation (Caltrans), and the Alameda County Department of Environmental Health. In those cases where there is evidence of contamination of ground and surface water, the State and Regional Water Resources Control Boards have oversight. The Bay Area Air Quality Management District would respond to the release of airborne contaminants to ensure compliance with applicable rules and regulations.

<u>The California Environmental Quality Act (CEQA)</u>

CEQA provides a mechanism for investigating potential impacts arising from the transport use or disposal of hazardous materials. CEQA requires identification of projects that would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.

Once these risks are known, the project applicant must either propose project alternatives or take appropriate actions (mitigation measures) to reduce the impact to acceptable levels.

Hazardous Materials Program[31]

The Hazardous Materials / Waste Program for waste generation was established by the County Board of Supervisors in 1985 and recognized by the State of California Department of Toxics Substances Control (DTSC) through a Memorandum of Understanding. In quick succession the county's hazardous materials management plan program, underground storage tank program, tiered permitting program, and risk management program also started.

The Alameda County Department of Environmental Health (ACDEH) Certified Unified Program Agency (CUPA) is the administrative agency that coordinates and enforces numerous local, state, and federal hazardous materials management and environmental protection programs in the county. The CUPA administers the following programs:

Hazardous Materials Business Plan Program: Chapter 6.95 of the Health and Safety Code establishes minimum statewide standards for Hazardous Materials Business Plans (HMBP's). HMBP's contain basic information on the location, type, quantity, and health risks of hazardous materials and/or waste. Each business shall prepare a HMBP if that business uses, handles, or stores a hazardous material and/or waste or an extremely hazardous material in quantities greater than or equal to the following:

- 55 gallons for a liquid

[31] This information was obtained from the Department of Environmental Health website http://www.acgov.org/aceh/hazard/index.htm

- 500 pounds of a solid
- 200 cubic feet for any compressed gas
- Threshold planning quantities of an extremely hazardous substance

Hazardous Waste Generator Program: The Hazardous Waste Generator Program regulates businesses that generate any amount of a hazardous waste. Proper handling, recycling, treating, storing and disposing of hazardous waste are key elements to this program.

Underground Storage Tank Program: The Underground Storage Tank (UST) Program regulates the construction, operation, repair and removals of UST systems used to store hazardous materials and/or waste.

California Accidental Release Program: The California Accidental Release Program (Cal ARP) requires any business that handles more than threshold quantities of an extremely hazardous substance to develop a Risk Management Plan (RMP). The RMP is implemented by the business to prevent or mitigate releases of regulated substances that could have off-site consequences through hazard identification, planning, source reduction, maintenance, training, and engineering controls.

Tiered Permitting: The Tiered Permitting Program regulates the onsite treatment of hazardous waste.

Aboveground Storage Tanks: Facilities with a single tank or cumulative aboveground storage capacities of 1,320 gallons or greater of petroleum-based liquid product (gasoline, diesel, lubricants, etc.) must develop a Spill Prevention Control and Countermeasure plan (SPCC). An SPCC plan must be prepared in accordance with the oil pollution prevention guidelines in the Federal Code of Regulations (40 CFR, 112). This plan must include procedures, methods, and equipment at the facility to prevent discharges of petroleum from reaching navigable waters. A Registered Professional Engineer must certify an SPCC plan and a complete copy of the plan must be maintained on site.

The ACDEH CUPA program has jurisdiction in the following communities: Alameda, Albany, Castro Valley, Dublin, Emeryville, Piedmont, Newark, San Lorenzo, Sunol, and the unincorporated areas of Fremont, Hayward, Livermore, Pleasanton, San Leandro and parts of Byron, Mountain House and Tracy.

Household Hazardous Waste[32]

The Alameda County Household Hazardous Waste Program is operated as a partnership between the Alameda County Department of Environmental Health and StopWaste.org. Household hazardous wastes include leftover paint, solvents, antifreeze, used oil and batteries, cleansers, pesticides and pool chemicals. Alameda County has implemented provisions of its Household Hazardous Waste Plan that called for the development of three permanent facilities for household waste collection and recycling in Oakland, Hayward, and Livermore. These facilities collect, identify, sort, store, pack, and recycle or dispose of all hazardous wastes (except radioactive waste and explosives) delivered by residents of Alameda County and small businesses.

Emergency Response

The Alameda County Fire Department would respond to any discharge of hazardous waste.

2.3. Goals, Policies and Implementing Actions

Goal 4.	**Minimize residents' exposure to the harmful effects of hazardous materials and waste.**

Policies

P1. Uses involving the manufacture, use or storage of highly flammable (or toxic) materials and highly water reactive materials should be located at an adequate distance from other uses and should be regulated to minimize the risk of on-site and off-site personal injury and property damage. The transport of highly flammable materials by rail, truck, or pipeline should be regulated and monitored to minimize risk to adjoining uses. (Source: Seismic Safety and Safety Element, pg. 8-9)

P2. The County shall strive to reduce hazardous waste using the following hierarchy of waste management strategies:

- Reduce the sources of hazardous waste.
- Recycle and reuse hazardous waste.

[32] For more information about this program please go to the following website http://www.stopwaste.org/home/index.asp?page=293

- Treat or incinerate residual hazardous waste.

- Place reduced or untreatable waste in secure land disposal units. (Source: Eden Area Plan, pg. 8-23)

P3. The County shall minimize risks of exposure to or contamination by hazardous materials by educating the public, establishing performance standards for uses that involve hazardous materials, and evaluating soil and groundwater contamination as part of development project review.

P4. New or expanding businesses shall be required to demonstrate compliance with the hierarchy of waste management strategies listed in Policy 1 (P1) of this Goal as a condition of receiving land use and business permits. (Source: Eden Area Plan, pg. 8-24)

P5. All existing hazardous waste generators shall be required to implement the hazardous waste management hierarchy listed in Policy 2 (P2) of this Goal to the maximum extent feasible, both technically and economically. (Source: Eden Area Plan, pg. 8-24)

P6. Adequate separation shall be provided between areas where hazardous materials are present and sensitive uses such as schools, residences and public facilities. (Source: Eden Area Plan, pg. 8-24)

P7. The County shall assist the Alameda County Waste Management Authority with the implementation of the *Alameda County Integrated Waste Management Plan* and the *Alameda County Hazardous Waste Management Plan*. (Source: Eden Area Plan, pg. 8-24)

P8. Developers shall be required to conduct the necessary level of environmental investigation to ensure that soil, groundwater and buildings affected by hazardous material releases from prior land uses and lead or asbestos in building materials will not have a negative impact on the natural environment or health and safety of future property owners or users. This shall occur as a pre-condition for receiving building permits or planning approvals for development on historically commercial or industrial parcels. (Source: Eden Area Plan, pg. 8-24)

P9. The safe transport of hazardous materials through the unincorporated areas shall be promoted by implementing the following measures:

- Maintain formally-designated hazardous material carrier routes to direct hazardous materials away from populated and other sensitive areas.
- Prohibit the parking of empty or full vehicles transporting hazardous materials on County streets.
- Require new pipelines and other channels carrying hazardous materials avoid residential areas and other immobile populations to the extent possible.
- Encourage businesses to ship hazardous materials by rail. (Source: Eden Area Plan, pg. 8-24)

P10. Emergency response plans shall be submitted as part of all use applications for any large generators of hazardous waste. (Source: Eden Area Plan, pg. 8-25)

P11. To the extent feasible, the County shall continue to support the removal of hazardous wastes from the solid waste stream in unincorporated Alameda County in accordance with Countywide plans. (Source: Eden Area Plan, pg. 8-25)

Actions

A1. Enforce applicable provisions of the Zoning and Building Ordinances.

A2. Utilize zoning to segregate potentially hazardous uses. Hazardous materials should be located so that they are not affected by disasters such as fire, floods, and earthquakes. (Source: Seismic Safety and Safety Element, pg. 9)

A3. Enforce the Alameda County Solid Waste Management Plan. (Source: Seismic Safety and Safety Element, pg. 9)

A4. Cooperate with the Alameda County Waste Management Authority and Alameda County Department of Environmental Health to implement the hierarchy of waste management strategies listed in Policy 2 of this Goal. (Source: Eden Area Plan, pg. 8-25)

A5. Continue to implement local siting criteria in order to implement relevant and applicable provisions consistent with the hazardous materials and waste management plans for Alameda County. (Source: Eden Area Plan, pg. 8-25)

A6. Coordinate with the Alameda County Department of Environmental Health, Hazardous Materials Division and other appropriate regulatory agencies during the review process of

all proposals for the use of hazardous materials or those involving properties that may have toxic contamination such as petroleum hydrocarbons, asbestos, and lead. (Source: Castro Valley Plan, pg. 10-34)

A7. Require applicants of projects in areas of known hazardous materials occurrences such as petroleum hydrocarbon contamination, USTs, location of asbestos rocks and other such contamination to perform comprehensive soil and groundwater contamination assessments in accordance with regulatory agency testing standards, and if contamination exceeds regulatory action levels, require the project applicant to undertake remediation procedures prior to grading and development under the supervision of appropriate agencies such as Alameda County Department of Environmental Heath, Department of Toxic Substances Control, or Regional Water Quality Control Board. (Source: Castro Valley Plan, pg. 10-34)

A8. Amend the County zoning regulations and project review processes to ensure that uses involving the use, storage, or transport of highly flammable, toxic, and/or highly water-reactive materials are located at an adequate distance from other uses and where they will not be adversely affected by disasters such as major fires, floods, or earthquakes. Regulate these uses to minimize the risk of on-site or off-site personal injury and property damage. (Source: Castro Valley Plan, pg. 10-34)

A9. Educate businesses and residents (for example through information on the County's website, etc.) about the proper use, storage, and disposal of hazardous materials, but also ways to reduce or eliminate the use of hazardous materials, including the use of non-toxic or less-toxic alternatives. (Source: Castro Valley Plan, pg. 10-33)

3.0 AVIATION HAZARDS

Within Alameda County there are three airports: Oakland International, Hayward Executive, and the Livermore Municipal Airports. The unincorporated areas are affected by flights not only arriving and departing from these airports, but also from the nearby San Francisco International Airport and the San Jose International Airport. As a result, the airspace over Alameda County is quite crowded, making the potential for crash an ever-present concern.

3.1. Aviation Regulations Related to Land Use and Development

In California, there are various levels of government oversight for land use planning near airports.

- **Federal:** Federal Aviation Administration (FAA) FAA approves airport noise studies, is the lead in the federal environmental processes, and manages the nation's airspace. The FAA publishes standards for the airside of the airport and provides planning guidelines for use by airport sponsors.

- **State:** The Caltrans Division of Aeronautics provides for the integration of aviation into transportation system planning on a regional, statewide, and national basis. Staff administers noise regulation and land use planning laws that foster compatible land use around airports heliports and encourages environmental mitigation measures to prevent incompatible land use encroachment. In addition, the California Environmental Quality Act (CEQA) requires that a project be screened for the creation of potential hazards within two miles of a public airport.

- **Airport Land Use Commissions (ALUCs):** Airport Land Use Commissions (ALUCs) are established pursuant to the State ALUC law (Public Utilities Code Article 3.5, State Aeronautics Act, Section 21661.5, Section 21670 et seq., and Government Code Section 65302.3 et seq.) to protect the public health, safety, and welfare by promoting the orderly expansion of airports and adoption of land use measures by local public agencies to minimize exposure to excessive noise and safety hazards near airports, heliports and helipads. ALUCs establish policies for land uses around airports, heliports and helipads, ensuring that those uses are compatible with airport operations. This is accomplished through the development of Airport Land Use Compatibility Plans (ALUCPs) which address these four impact areas: Noise, Safety, Airspace Protection, and Overflight. ALUCs also ensure that county and city plans (general, specific and other) and proposed land use policy actions are consistent with the ALUCP. This is done on an advisory basis.

- **Local Governments:** Cities and/or counties have a responsibility to ensure the orderly development of the airports within their local jurisdiction and make sure all applicable planning documents and building regulations are consistent with the ALUCP. They also have the final decision on local land use issues and have the ability to overrule ALUC determinations, with conditions.

Alameda County Airport Land Use Commission

The Alameda County Airport Land Use Commission (ALUC) is an advisory body that assists local agencies in their efforts to comply with the provisions of the four compatibility impact areas (noise, safety, airspace, and overflight) when planning for land uses near airports. Safety Zone Compatibility Criteria have been established for seven distinct zones within the Airport Influence Areas (AIAs) for each of the

three airports in the county. Please refer to the following webpage for specific information http://www.acgov.org/cda/planning/generalplans/airportlandplans.htm.

Heliports and Helipads

The ALUCP applies to any site and environs of any existing or proposed public-use, private-use, or special-use heliport or helipad (as defined by Caltrans) in the County. Table S – 6 summarizes information regarding heliports located in unincorporated Alameda County.

Table S - 6: Heliports in Unincorporated Alameda County[33]

Heliport Name	Location	Public/Private	Number of Daily Operations	Number of Night Operations (10:00 PM to 7:00 AM)
ACFD, Station 14	11345 Sunol Blvd. Sunol, CA 94586	Public	N/A	N/A
Eden Medical Center	20103 Lake Chabot Road Castro Valley, CA 94546	Private	Variable*	Variable*
Fairview Site	27218 Fairview Avenue Fairview, CA 94542	Private	N/A	N/A
Little Valley Site	Sunol, CA	Private	N/A	N/A

Notes: *Variable use at hospitals is based upon need. N/A = Not available

FAA Advisory Circular (AC) 150-5390-2B "Heliport Design" provides recommendations for heliport design and describes the federal requirements associated with heliport development. Alameda County encourages those with heliport proposals to implement the guidance set forth in the AC to the greatest extent practicable. The AC is available online from the FAA website at www.faa.gov. For more information about heliport permitting, please contact Caltrans' Division of Aeronautics (www.dot.ca.gov/hq/planing/aeronaut/index.html). Also see section 2.7.4 of the ALUCPs for ALUC review criteria for new heliports, or heliport master/development plans.

Emergency Response

The Alameda County Fire Department has staff capable of responding to aviation accidents, both on land and the sea. The City of Oakland also has a special fire-fighting unit at the Oakland International Airport equipped with special apparatus for aviation accidents. The US Coast Guard will respond to an aircraft incident over the water. The County, Port of Oakland, and the US Coast Guard have periodic drills to ensure readiness in the event of a water crash landing.

[33] *Oakland Airport ALUCP*, December 2010, page 2-5

3.2. Goals, Policies and Implementing Actions

Goal 5.	**Minimize potential impacts from aircraft accidents at facilities that contain hazardous materials and waste**

Policies

P1. Require proposed land use projects within Airport Influence Areas (AIAs) that utilize hazardous materials (flammable, explosive, corrosive or toxic) be referred to the ALUC for a compatibility determination.

Actions

A1. Consult the Alameda County's ALUCPs for proposed land uses prior to approval of Discretionary or Ministerial Projects.

A2. Refer all updates to County General Plans, Specific Plans, and Zoning Ordinances to the Alameda County ALUC for a compatibility determination.

A3. Special measures to minimize risk in the event of an aircraft accident to be determined by the permitting agencies in Safety Zones 3-5 in each airport's AIA.

A4. Storage fuel and other hazardous materials within the airport environs are restricted as follows:

- Within Safety Zones 1 and 2, storage of any such substance is prohibited.
- Within Safety Zone 3, storage of fuel or other hazardous materials is permitted only if the substances are stored in underground tanks, and the quantity stored is no more than 2,000 gallons.

CHAPTER 3: EMERGENCY PREPAREDNESS

1.0 PURPOSE AND INTENT

The Safety Element provides a policy framework for the implementation of short-range emergency preparedness plans to maintain long-term safety goals. This chapter describes the protection and response providers for the unincorporated areas of the County.

1.1. Disaster Planning and Preparedness

Local Hazard Mitigation Plan (LHMP)[34]

The federal Disaster Mitigation Act of 2000 (DMA 2000) requires that cities, counties, and special districts have a Local Hazard Mitigation Plan to be eligible to receive Federal Emergency Management Agency (FEMA) hazard mitigation funds. To assist local governments in meeting this requirement, the Association of Bay Area Governments is the lead agency on the multi-jurisdictional Local Hazard Mitigation Plan (LHMP) for the San Francisco Bay Area. Cities and counties can adopt and use all or part of this multi-jurisdictional plan in lieu of preparing all or part of a Local Hazard Mitigation Plan themselves. The County LHMP addresses potential damages in the unincorporated portions of the County, as well as to County facilities. Cities, schools, special districts, and eligible non-profit organizations within the County must prepare and submit separate Hazard Mitigation Plans to FEMA for approval.

The County, in conjunction with its many emergency services partners, has prepared its local annex to the LHMP that sets strategies for coping with the natural and man-made hazards faced by residents. The plan is a compilation of information from County departments correlated with known and projected hazards that face northern California. The plan complies with, and has been approved by, FEMA and the Governor's Office of Emergency Services (OES). The plan has been formally adopted by the County Board of Supervisors (BOS) for use in the development of specific hazard mitigation proposals.

Under Assembly Bill 2140 (Hancock, 2006) local jurisdictions are required to adopt the LHMP as an implementation appendix to their Safety Elements in order to receive full reimbursement of post-disaster public assistance from FEMA. The LHMP will be updated on a schedule as determined by FEMA. Mitigation strategies included in the LHMP will serve as the implementation plan for the Safety Element. A copy of the current LHMP will reside in Appendix A.

[34] For more information about this program please go to the ABAG website located at http://quake.abag.ca.gov/

Community Education

The Alameda County Fire Department offers the Personal Emergency Preparedness (PEP) and Community Emergency Response Team (CERT) trainings to provide community members with the tools and resources to become better prepared and self-sufficient during a large-scale emergency or disaster. The department also provides the Map Your Neighborhood (MYN) project, an all hazards response tool to educate members of the community to become more prepared during the pre-planning and response phase of a large-scale emergency. Please refer to the ACFD website for more information about these programs.

Standard Emergency Management System (SEMS)

Alameda County will follow the Standard Emergency Management System (SEMS) when responding to any disaster. SEMS is a management system that provides an organizational framework and guidance for operations at each level of California's emergency management system. The objective of SEMS is to improve the coordination of state and local emergency response. SEMS is not a physical agency; it is a procedure for integrating emergency response functions. As its name implies, the SEMS provides guidelines for standardization of procedures and approaches to emergency response; facilitation of the flow of information and resources between organizational levels (field, local government, operation area, regional and state); coordination between responding agencies; and rapid mobilization, deployment, use and tracking of resources. All local governments must use SEMS in multi-jurisdictional or multi- agency emergency responses to be eligible for state reimbursement of response- related personnel costs.

Operational Area Emergency Response

A crucial emergency response plan for the unincorporated areas of the County is the Operational Area Emergency Response Plan (OAERP), which is prepared by the Alameda County Office of Homeland Security and Emergency Services in consultation with various public and private entities. The intent of the plan is to strengthen short and long-term emergency responses and recovery capability, and to identify emergency procedures and emergency management routes in the County.

In Alameda County, the Operational Area was established by the January 1995 "Agreement for Participation in Alameda County Operational Area Emergency Management Organization" (Agreement). According to the Alameda County Office of Homeland Security and Emergency Services (the Sheriff's Department), all the cities in the county and the county are participants in this Agreement. The Agreement establishes an organizational structure for disaster response for the County of Alameda, cities, special districts, and other public benefit non-profit corporations (e.g. the American Red Cross) that participate in the Agreement. The Agreement forms a partnership for a systematic approach for exchanging disaster intelligence, mutual aid requests, and resource requests in emergencies. It also

provides emergency preparedness on a day-to-day basis through cooperative training and exercise activities. It establishes a primary contact point during an emergency in Alameda County for sharing disaster intelligence among local agencies and between the Operational Area Emergency Management Organization and state and federal agencies requesting information.

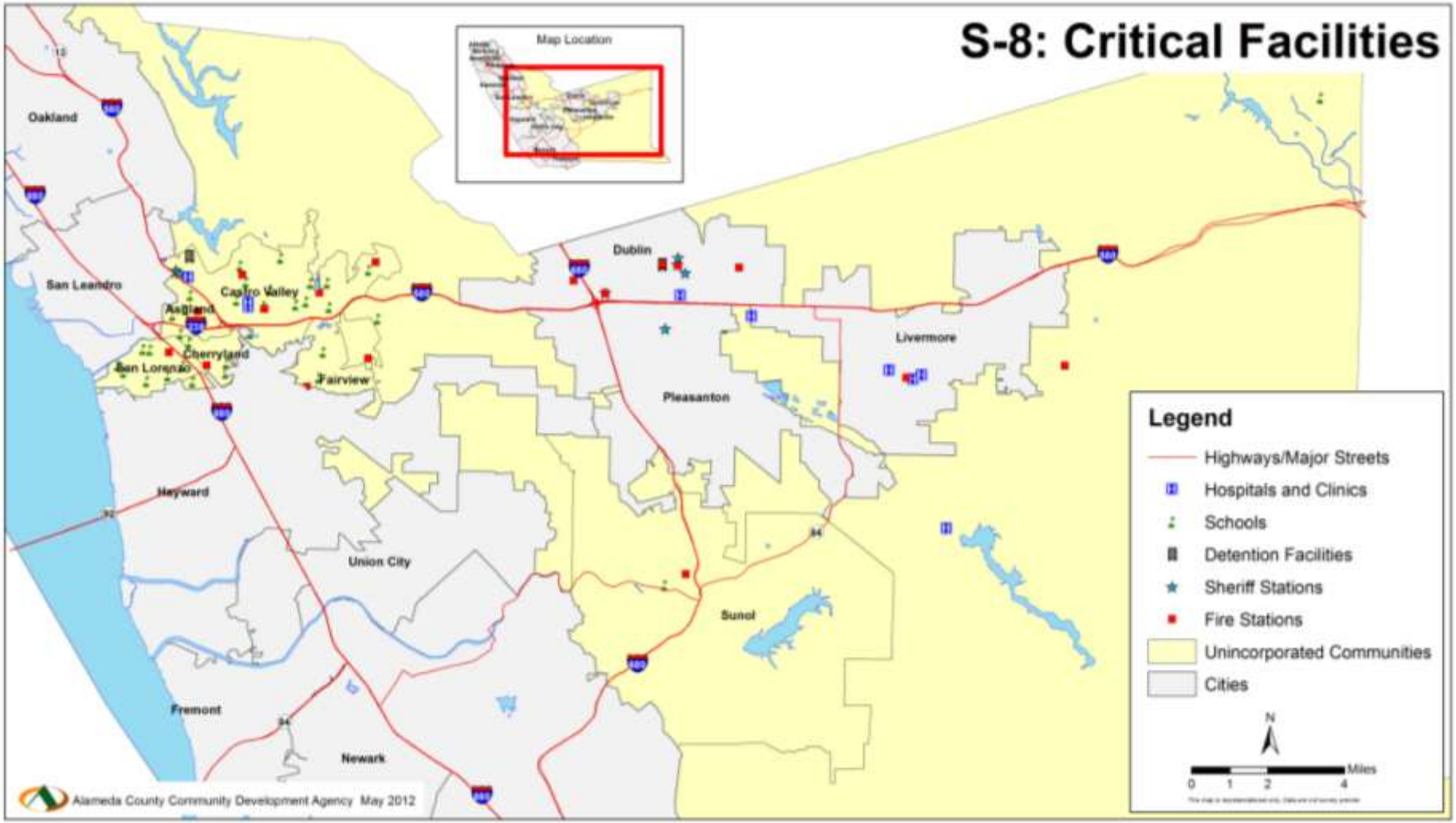
The Operational Area Emergency Management Organization assists the participating parties in sharing resources before, during, and after an emergency to prepare for, respond to, and recover from disasters that strike Alameda County. The Agreement specifies that the Alameda County Emergency Operations Plan is the primary method and criteria used to conduct Operational Area Emergency Center activities. The Emergency Operations Plan also includes a description of the various functional responsibilities for County departments.

Related Plans

The County must prepare and periodically update several policy, planning and logistical documents pertaining to emergency response. An inventory of these plans is provided in Appendix B.

Emergency Facilities and Shelter Sites

A map indicating the locations of emergency facilities and shelter sites is provided on the following page.


S-8: Critical Facilities
Map Location
Oakland
San Leandro
Ashland
Cherryland
San Lorenzo
Castro Valley
Fairview
Dublin
Pleasanton
Livermore
Hayward
Union City
Sunol
Fremont
Newark
Legend
Highways/Major Streets
Hospitals and Clinics
Schools
Detention Facilities
Sheriff Stations
Fire Stations
Unincorporated Communities
Cities
N
Miles
0 1 2 4
Alameda County Community Development Agency May 2012

A listing of emergency services providers and resources for unincorporated Alameda County is provided in Appendix C.

Police Services

The Alameda County Sheriff's Office is a full service law enforcement agency accredited through the Commission on Accreditation for Law Enforcement Agencies (CALEA) and the American Correctional Association (ACA). The Sherriff's Office has 1,500 authorized positions, including 1,000 sworn personnel distributed among five divisions, each headed by a Commander. The County's Emergency Operations Center (EOC) was dedicated in 1996 and is coordinated and maintained by the Sheriff's Office of Homeland Security and Emergency Services (SOHSE). The SOHSE is a proactive effort to enhance the Department's response to potential threats related to local homeland security issues, such as terrorism or bio-terrorism. The SOHSE maintains a 24-hour response capability that includes the mobilization of the following volunteer units: Air Squadron, Communications Team, Mounted Posse, Search and Rescue Unit, and two Underwater Recovery Units.

1.2. Goals, Policies and Implementing Actions

Goal 6.	**Prepare and keep current County emergency procedures in the event of potential natural or man-made disaster.**

Policies

P1. The County shall coordinate its efforts with other local jurisdictions for hazard and disaster response planning and to minimize risks associated with man-made and environmental hazards. (Source: Eden Area Plan, pg. 8-26)

P2. Adequate emergency water flow, emergency vehicle access and evacuation routes shall be incorporated into any new development prior to project approval. (Source: Eden Area Plan, pg. 8-26)

Actions

A1. Complete regularly scheduled reviews and updates of its emergency preparedness plans. (Source: Eden Area Plan, pg. 8-26)

A2. Conduct periodic mock exercises using emergency response systems to test the effectiveness of County procedures included in the emergency management plan. (Source: Eden Area Plan, pg. 8-27)

A3. Develop public education programs on first-aid training and disaster preparedness that encourage residents and businesses to stockpile emergency food, water and medical supplies, and provide information on emergency access routes. Other topics should be included as necessary. (Source: Eden Area Plan, pg. 8-27)

A4. Work with Caltrans, and the local and Countywide fire and police departments to identify appropriate emergency access routes through the unincorporated areas. (Source: Eden Area Plan, pg. 8-27)

A5. Coordinate with the school districts, hospitals, and other major public and private agencies and organizations, including agencies that serve seniors, persons with disabilities, non-English speakers and others who may need special support during an emergency, to develop and implement an effective disaster plans. (Source: Castro Valley Plan, pg. 9-13)

A6. Adopt and amend as needed the Alameda County Annex to the Multi-jurisdictional Local Hazard Mitigation Plan as required under the federal Disaster Mitigation Act of 2000.

A7. The Alameda County Annex to Multi-jurisdictional Local Hazard Mitigation Plan (LHMP) adopted by the Board of Supervisors and approved by the Association of Bay Area Governments (ABAG) shall serve as the implementation program for the coordination of hazard planning and disaster response efforts within the County and is incorporated by reference to this Element as the Implementation Appendix, Appendix A.

A8. The County will ensure that the LHMP is updated regularly to keep pace with the needs of its residents.

The pages that follow contain the Alameda County Annex to the Local Hazard Mitigation Plan (LHMP) that was adopted by the Alameda County Board of Supervisors on January 24, 2012 with subsequent approval by the Federal Emergency Management Agency (FEMA).

County of Alameda

Annex to 2010 Association of Bay Area Governments Local Hazard Mitigation Plan *Taming Natural Disasters*

County of Alameda

County of Alameda

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County of Alameda

Introduction

In 1853, just three years after the addition of California as the 31st state of the union, the County of Alameda was established. Located on the east side of San Francisco Bay, it was carved out of territory from two previously established neighboring counties, Contra Costa and Santa Clara. The name of the County, "*Alameda*" means "a place where poplar trees grow". It was derived from the Spanish/Mexican heritage of the region and was actually the name originally given to a local creek, the Arroyo de la Alameda (Poplar Grove Creek).

Though sparsely populated in the early years after incorporation, the County has since become the 7th most crowded in California. With a population of 1,556,657 – a density of 2,110 persons per square mile – the number of County residents has increased 4% since 2007 when the original Annex to the ABAG Multi-jurisdictional Plan was completed. Its 14 cities and 6 unincorporated areas are located within 738 square miles of land alongside 84 square miles of water for a total area of 831 square miles.

The County government, with 9,103 employees and a current operating budget of $2.44 billion, currently owns and occupies approximately 6.5 million square feet of office and institutional space, leases another 1.2 million, and also owns, operates, and maintains bridges, dams, and other infrastructure (see the map of the County's jurisdictional boundaries in **Exhibit A**).

Alameda County's residents, since the time of incorporation, have enjoyed a diverse and beautiful landscape which includes rolling open spaces, urban marinas and coastal plains along the bay, and densely vegetated hillsides with lakes and streams. Along with this natural beauty, however, come the associated dangers that such features bring. These include wildfires, landslides, flooding, and earthquakes. This last natural hazard is the result of a network of faults that permeate the area. Running mostly north to south, the primary faults include Greenville, northern Calaveras, the southern tip of Diablo, and one of the most dangerous fault systems in the United States, the North-South Hayward. And, lurking to the west across the bay is the ever-present San Andreas fault. While not located within the boundaries of Alameda County, it, too, poses a serious threat.

These inherent dangers, both in and around the County, have produced a number of emergencies and major disasters including numerous floods, the Hayward Quake of 1868, The Great San Francisco Earthquake and Fire of 1906, the Oakland Hills Fire Storm of 1991, and the Loma Prieta Earthquake of 1989.

The Regional Planning Process

The County participated in various ABAG workshops, conferences, and meetings, including:

- The Sub-Regional meeting on May 8, 2009 to review draft priorities and reach consensus on priorities for mitigation (representatives from county staff);
- 8 ABAG Regional Planning Committee meetings (two Board of Supervisors members plus representatives from County staff);
    - Various dates: 04/02/2008, 08/06/2008, 10/01/2008, 12/03/2008, 04/01/2009, 06/03/2009, 08/05/2009, 10/07/2009.
- ABAG Executive Board meeting (two Board of Supervisor members) on September 17, 2009, and;
- Wildfire Workshop (representatives from county staff) on July 2, 2009.

At these meetings Alameda County representatives provided input on the regional mitigation strategies that were important to the County and shared relevant mitigation successes and challenges with the various groups. For more information on these meetings and for rosters of attendees, please see Appendix A and H in the ABAG Multi-Jurisdictional Local Hazard Mitigation Plan 2010 (MJ-LHMP). In addition, the County has provided written and oral comments on the multi-jurisdictional plan and provided information on facilities that are defined as "critical" to ABAG.

The Local Planning Process – History and Current Structure

Starting in 2004, a team composed of Alameda County senior management and staff began working with ABAG to develop an Annex to the then pending 2005 ABAG Multi-Jurisdictional Local Hazard Mitigation Plan. The County's Mitigation Planning Team was composed of an Executive Committee, a Working Group, and individual agency Disaster Mitigation Teams, as follows:

- The Executive Committee (EC): Chaired by the County Administrator's Office and composed of senior management personnel from General Services (GSA), Community Development (CDA), Public Works (PWA), Health Care Services (HCSA), Public Health (PHD), Office of Emergency Services (OES), Sheriff's Office (ACSO), and Fire Department (ACFD). This was the ultimate decision-making unit that also provided leadership and support for creating the plan and represented the County to various interest groups, government agencies, and the community.
- Working Group (WG): Chaired by GSA and CDA and comprised of two staff each from the participating agencies/departments noted above, plus participation from the Alameda County Medical Center (ACMC). The unit was responsible for day-to-day research, legwork, analysis, and making recommendations to the EC such as identifying mitigation strategies, prioritizing them, and making revisions to the Annex. This group also represented the County at ABAG workshops, conferences, and various public meetings.

- Disaster Mitigation Teams (DMT): Led by two Agency Representatives from each participating agency who report to the WG. This unit was further comprised of staff from various departments within each respective agency and responsible for performing research and developing recommendations for their respective agencies on a variety of subjects, among them being revisions to the Annex and the identification and prioritization of mitigation strategies. In addition, these staff members were also available to the WG as a resource to develop multi-disciplinary sub-committees for specialized research.

The Annex was adopted in 2007 under a process which followed FEMA guidelines, such that after approval by FEMA of the Annex, the County Board of Supervisors then adopted the plan in a public meeting via an official Board Resolution. Said resolution required the Annex and its mitigation strategies become an implementation appendix of the Safety Element in the County's General Plan. In addition, a subsequent resolution now requires that if the Board adopts any future FEMA-approved updates or amendments to the LHMP *"…the revised document shall replace any previous version of the document.*" This insures the continued implementation of Annex updates and mitigation activities in perpetuity.

It was through this three-tiered structure that each agency participated in the development of the 2007 Alameda County Annex to the 2005 ABAG plan and, with the current exception that GSA alone chairs the Mitigation Planning Team, it has remained essentially unchanged to this day as the method used to develop the updated 2010 Annex.

Review and Incorporation of Existing Information

Below is a table of existing plans, reports, studies, and technical information that were used in the development of this Annex.

EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION	METHOD OF INCORPORATION INTO THE JURISDICTION ANNEX
Alameda County General Plan (with recent amendments from March 2010)	Hazards assessment and mitigation strategies
2010-2015 Alameda County Capital Improvement Plan	Mitigation projects
Grading Ordinance 0-2010-19	Risk assessment
Geotechnical Evaluations of County Dams (w/ the California Div. of Safety of Dams)	Risk assessment and mitigation strategies/projects
Geotechnical Evaluations of County Levees (w/ California Dept. of Water Resources)	Risk assessment and mitigation strategies/projects (levee certification is being done by FEMA)

PWA-FCD Hydraulic & Hydrologic Studies.	Flood risk assessment
2007-2008 Alameda County Final Budget Report	Demographics and background data
2009-2010 Alameda County Final Budget Report	Demographics and background data
2010 ABAG Multi-Jurisdictional LHMP	Mapping, hazards assessment, strategies, risk data
1998 Seismic Evaluation of Eight Alameda County Fire Stations as "Essential Facilities" (cost estimates adjusted for local construction inflation)	Cost estimating for mitigation projects and historical data
2005 Alameda County Fire Department Program Budget Analysis New Construction and Seismic Retrofit and Remodeling – Fire Stations 1, 2, 4, 5, 6, 7, 8 (cost estimates adjusted for inflation)	Cost estimating for mitigation projects and historical data
Housing Repair and Reconstruction After Loma Prieta (from the UC Berkeley National Information Service for Earthquake Engineering)	Historical data

Process for Updating Plan Sections in the 2010-2015 Update

Under the auspices of the three-tiered structure and approval process noted above, subject-matter experts from the aforementioned County departments, made up of architects, planners, building department officials, facility managers, civil engineers, public health specialists, emergency managers, and sheriff and fire officials met on a regular basis to review the various plan sections as well as identify and prioritize appropriate mitigation strategies. Members of this group also participated in regional ABAG workshops, conferences, and meetings (see *Regional Planning Process* above).

At the first Working Group meeting, general priorities, a milestone schedule, and participants from appropriate County departments were confirmed along with beginning the review of ABAG's regional mitigation strategies (Exhibit F). Subsequent meetings built upon this task, prioritized said strategies specifically for Alameda County, examined the cost/benefit of each strategy, and reviewed preliminary budgets and potential funding sources for strategies designated as "High" priority for County-owned-and-operated facilities.

In addition, various sections of the Annex also needed to be reviewed, expanded, and restructured by the Mitigation Planning Team based on new requirements, information and/or improved data, as follows:

- Introduction: This section was revised and expanded to introduce key statistics and information about the origins of the County, its demographics, and the natural hazards prevalent in the area.
- The Planning Process: This section was revised and expanded to better depict the interface of regional and local planning efforts and reflect the activities that took place as part of the plan update process. In addition, this section includes the history and current structure of the County's Mitigation Planning Team, a brief review of resources and processes used to develop this Annex, and describes the goals and methodology of the public notification process.
- Hazards Assessment: This section was revised and expanded to include more history on the affects of natural hazards in Alameda County and tabulate more recent events that have occurred since the 2007 Annex. In addition, there are updates to the hazard maps referenced in the exhibits.
- Risk Assessment: This section was revised and expanded to include the most recent hazard mapping and land use data available, including easy-to-read charts tabulating differences between the 2007 and 2010 Annexes for hazard exposures to infrastructure and facilities.
- National Flood Insurance Program: This is a new section illustrating the County's partnering relationship with FEMA to modernize floodplain mapping and improve the County's CRS class rating for the benefit of County residents.
- Mitigation Activities and Priorities: This section was revised and expanded to include evaluation of progress from the 2007 Annex and development of mitigation strategies and projects for the next 5 years, both of which are tabulated in Exhibits D and E.
- Incorporation in Existing Planning Mechanisms: This is a new section delineating how hazard mitigation concepts are imported into standard County operations and planning initiatives for coordination purposes as well as to increase the visibility – and highlight the importance of – pre-disaster mitigation planning and emergency management.
- The Plan Update Process: This section was revised to include a means to monitor mitigation progress and a brief section on "lessons learned" regarding public participation enhancements for the next update cycle.

Public Meetings

Opportunity for public comments on the DRAFT mitigation strategies was provided at a public meeting at GSA headquarters on September 28, 2009 in Oakland from 6pm to 8pm. Complimenting that event was a second invitation for public input posted on the County website with a comment period stretching from October 12 to October 19, 2010 inviting members of the public to offer questions, suggestions, and comments via email and phone. In both instances, the

draft mitigation strategies and related links were published on the County website for public viewing.

The purpose of the public notifications was threefold: first, to educate local residents about hazard mitigation's importance to overall disaster preparedness for the community and region; secondly, to remind our residents about the hazards prevalent in our area; and third, to give them a voice in the development of the plan, especially with respect to developing and prioritizing the strategies to mitigate against said hazards.

The County's intent was to collate all public comments and suggestions received; have the Working Group and Executive Committee review them with the assistance of our emergency managers and ABAG; and then verify the congruency of the comments and suggestions with FEMA guidelines prior to inclusion in the Annex. However, no public comments were received from either the meeting or the internet posting. Copies of the text for the meeting invitation and the internet posting are included as **Exhibit B** to the Alameda County Annex. A brief "lessons learned" section at the end of this Annex notes possible methodologies to improve public participation for the 2015 Annex update (see the *Plan Update Process*).

Hazards Assessment

The 2010-2015 ABAG Multi-Jurisdictional Local Hazard Mitigation Plan, to which this is an annex, lists nine hazards that impact the Bay Area, five related to earthquakes (faulting, shaking, earthquake-induced landslides, liquefaction, and tsunamis) and four related to weather (flooding, landslides, wildfires, and drought). Maps of these hazards and risks are shown on the ABAG website at http://quake.abag.ca.gov/mitigation/.

The County has reviewed the hazards identified and ranked the hazards based on a review of our current General Plan Safety Element, reports and studies noted earlier (see *Review of Existing Plans* above), past disasters, and risk assessments from recognized experts on expected future impacts. The conclusion is that earthquakes (particularly shaking and liquefaction), flooding (including dam failure), wildfire, and landslides (including unstable earth) pose the most significant risks for potential loss in Alameda County.

Based on the risk assessment in the following sections, tsunamis do not pose a significant threat to Alameda County's facilities, infrastructure, or in the unincorporated areas. In addition, the County does not face any natural disasters not listed in the ABAG multi-jurisdictional plan and no new hazards have been identified by the County since the original development of the County's 2007 Annex to ABAG's 2005 plan.

While the County has undertaken a number of general hazard mapping activities since its first Safety Element was prepared, most of these maps are less detailed and are not as current as those

shown on the ABAG website at http://quake.abag.ca.gov/mitigation/. However, some additional maps developed by the County for earthquakes and wildfires are included as **Exhibit C**.

Past Occurrences Of Disasters (natural and human-induced)

The County has experienced a number of different disasters over the course of its history, including numerous earthquakes, floods, droughts, wildfires, energy shortages, civil disturbances, landslides, and severe storms.

One of the great early disasters in Alameda County occurred just a scant 15 years after incorporation. The Great Hayward Quake of October 21, 1868, with an epicenter near the small town of Hayward, was estimated to be between 6.8 and 7.0 and was one of California's most destructive ever. Damage was extensive and widespread throughout the region with reports from as far south as Gilroy to Santa Rosa in the north. In San Francisco, many buildings were damaged and 5 persons were reported killed.

However, most of the deaths and destruction occurred in Alameda County, which at the time had a population of approximately 21,000 (a density of approximately 28 persons per mile). In Hayward, a small town of only 500 residents, every building was destroyed or damaged. In neighboring San Leandro, with a population of only 400, the second floor of the Alameda County courthouse collapsed, and many other buildings were also damaged. In Mission San Jose in southern Fremont, the old adobe church and other buildings were also severely damaged.

The Hayward quake was originally referred to as the "Great San Francisco Earthquake", but that distinction was supplanted by a magnitude 7.8 temblor along the San Andreas Fault on April 18 1906. This quake and the ensuing fire, with an epicenter approximately 2 miles offshore of San Francisco's Golden Gate Park, caused an estimated 3,000 deaths and $524 million in property losses. Damage in the Alameda County cities Berkeley, Oakland, and Alameda also was severe. The Oakland Hills Fires of 1991, too, ranks as one of the worst wildland-urban firestorm disasters to ever strike the United States with 25 deaths, 150 injuries, and the displacement of over 10,000 persons. The blaze started when a 5-acre grass fire in the hills above Berkeley reignited after it was mistakenly thought to have been extinguished. With destruction and damage to over 3,400 family dwellings and 456 apartments, losses were approximately $1.7 Billion.

The Loma Prieta Earthquake of 1989 is yet another example of the kind of large scale disaster that can strike the Bay Area. Across the entire region it killed 63 persons, injured 3,757, displaced over 12,000 and caused approximately $6 Billion of damage. Area-wide, there were approximately 12,000 housing units destroyed or significantly damaged and over 30,000 experiencing some level of minor damage.

Within Alameda County itself, the quake significantly damaged the city halls of Oakland, Alameda, and Hayward. In addition, 42 of the 63 persons killed in the quake lost their lives at the Cypress Street Viaduct of the Nimitz 880 Freeway collapse. Finally, some 3,300 homes in Alameda County were destroyed or damaged, with total losses in Alameda County nearly $1.5 Billion. Reconstruction continues over two decades later as the replacement for the Oakland-Bay Bridge is still several years from completion.

Floods, too, have repeatedly taken their toll on the County throughout its history. According to the US Army Corps of Engineers, major flooding of San Lorenzo Creek occurred in the 1860s, 1870s, and the early 1880s. This trend continued through the 20th century with major floods occurring in January 1911, January 1916, February 1919, February 1925, December 1931, February 1940, January 1942, December 1950, December 1955, and April 1958. While damage reports from these events are scant at best, we do know that during the storms of 1962, flooding took place in the unincorporated areas of Alameda County, which, in combination with mud slides and gale winds, caused the region to be declared an emergency area.

The County has had a number of lesser incidents as well, such as landslides in the hills on the east side of the County, including one that damaged 12 homes in 1980. More information on State and Federally declared disasters in Alameda County can be found at http://quake.abag.ca.gov/wp-content/documents/ThePlan-D-2011.pdf. There have only been a few locally significant incidents that have impacted Alameda County between the adoption of the 2007 Annex and this current update. Two are related to natural events but most were human-induced incidents, including:

- January 2009 – Mehserle Shooting. Civil Disturbance. City of Oakland activated their EOC. Alameda County monitored the situation.
- May 2009 Vehicle vs Tanker truck. Gasoline spill in city of Dublin. City had partial activation. Alameda County OES monitored the situation.
- November 2009 -Takeover of Wheeler Hall, UC Berkeley. Students protested Increased Fees. Law Enforcement Mutual Aid from surrounding cities and Alameda County. UC Berkeley activated their EOC, Alameda County OES monitored the situation.
- February 27, 2010 – Chile Earthquake/Tsunami. State EOC activated. Alameda County EOC monitored the situation.
- July 8, 2010 – Mehserle Verdict. Civil Disturbance. City of Oakland activated its command post and main staging areas and requested mutual aid from other law enforcement agencies within Alameda County (including AC Sheriff's Office).
- Weather – Summer Heat and Winter Cold. During weather extremes Alameda county OES monitors the situation with cities that are affected.

County of Alameda

Risk Assessment

Urban Land Exposure

The County examined the hazard exposure of unincorporated Alameda County urban land based on information in ABAG's website at http://quake.abag.ca.gov/mitigation/pickdbh2.html. The "*2005 Existing Land Use with 2009 Mapping*" file was used for this evaluation (in the existing plan, the file used was "*Existing Land Use in 2000*").

In general, the hazard exposure of the county is increasing over time as the amount of urban land increases (In the last 5 years, 2,655 acres of land has become urban) and in some cases where new and more accurate mapping has become available. Alameda County actually reduced the acres of urban land in the 100 year flood zone over the last 5 years due to certification of several levees in the County which removed those areas from the flood plain. The following table described the exposure of urban land within the unincorporated County to the various hazards.

Exposure (acres of urban land – unincorporated area)			
Hazard	**2005**	**2010**	**Change**
Total Acres of Urban Land	*33,366*	*36,021*	*2,655*
Earthquake Faulting (within CGS zone)	1,594	2,054	460
Earthquake Shaking (within highest two shaking categories)[1]	17,593	18,638	1,045
Earthquake-Induced Landslides (within CGS study zone)[2]	2,766	4,965	2,199
Liquefaction (within moderate, high, or very high liquefaction susceptibility	9,095	11,212	2,117
Flooding[3] (within 100 year floodplain)	1,010	984	(26)
Flooding (within 500 year floodplain)	900	1,430	530
Landslides (within areas of existing landslides)[4]	3,999	4,466	467
Wildfire (subject to high, very high, or extreme wildfire threat)[5]	15,686	13,981	(1,705)
Wildland-Urban Interface Fire Threat	10,178	11,100	922
Dam Inundation (within inundation zone)	4,334	4,597	263
Tsunamis[6] (within inundation area)	not applicable		
Drought[7]	33,366	36,021	2,655

[1] In large part because the Hayward, Greenville, and Calaveras fault systems run through the County.
[2] The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done.
[3] The decrease of 26 acres is due to better and more accurate mapping.
[4] The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done.
[5] The decrease is due to better and more accurate mapping.
[6] Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.
[7] The entire Alameda County unincorporated area is subject to drought.

Infrastructure Exposure

The County also examined the hazard exposure of infrastructure within the unincorporated County based on the information on ABAG's website at http://quake.abag.ca.gov/mitigation/pickdbh2.html. The *"Existing Infrastructure, 2004"* file was used for this evaluation. It was determined that the infrastructure data did not need to be updated for this plan, but the data was re-evaluated against the newest hazard maps available.

Exposure (miles of infrastructure – unincorporated area)						
Hazard	**Roadway**		**Transit**		**Rail**	
	2005	**2010**	**2005**	**2010**	**2005**	**2010**
Total Miles of Infrastructure	*1,524*	*947*	*11*	*34*	*38*	*52*
Earthquake Shaking (within highest two shaking categories)	701	537	8	18	22	23
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility	333	360	2	18	21	6
Liquefaction Hazard (within CGS study zone)[1]	140	222	3	8	9	11
Earthquake-Induced Landslides (within CGS study zone)[2]	50	61	1	4	1	6
Earthquake Faulting (within CGS zone)	75	59	0	2	2	2
Flooding (within 100 year floodplain)	31	10	0	0	4	1
Flooding (within 500 year floodplain)	28	46	0	0	2	1
Landslides (within areas of existing landslides)	440	116	2	5	4	7
Wildfires (subject to high, very high, or extreme wildfire threat)	1140	359	5	16	24	30
Wildland-Urban Interface Fire Threat	280	283	3	7	10	12
Dam Inundation (within inundation zone)	143	123	1	9	18	21
Tsunamis[3] (within inundation area)	not applicable					
Drought[4]	not applicable					

[1] 1,083 miles of roadway, 3 miles of transit, and 21 miles of rail are outside the area that has been evaluated by CGS for this hazard

[2] The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done. 1,083 miles of roadway, 3 miles of transit, and 21 miles of rail are outside the area that has been evaluated by CGS for this hazard

[3] Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. Miles of exposed infrastructure is not an appropriate analysis for this hazard. This map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

[4] Miles of exposed infrastructure is not an appropriate analysis for this hazard.

Exposure of County-Owned Buildings, Critical Healthcare Facilities, and Schools

Finally, the County examined the hazard exposure of critical health care facilities and schools located within the unincorporated County, and County-owned buildings based on the information on ABAG's website at http://quake.abag.ca.gov/mitigation/pickcrit2010.html and compared it to the data available from the 2005 plan year at http://quake.abag.ca.gov/mitigation/pickcrit.html. The County provided a list of the critical facilities it owns to ABAG. ABAG provided a detailed assessment of the hazard exposure of each of its facilities. The following number of facilities is exposed to the various hazards analyzed.

County of Alameda

Exposure (number of facility types)								
Hazard	**Hospitals** (Total County Area)		**Schools** (Total County Area)		**County-owned bridges and interchanges** (Unincorporated Area)		**County-owned critical facilities** (Total County Area)	
	Plan Year 2007	**Plan Year 2010**	**Plan Year 2007**	**Plan Year 2010**	**Plan Year 2007**	**Plan Year 2010**	**Plan Year 2007**	**Plan Year 2010**
Total Number of Facilities	*3*	*4*	*36*	*53*	*53*	*54*	*15*	*22*
Earthquake Shaking (within highest two shaking categories)	3	4	31	38	29	22	6	9
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility	0	3	16	28	25	4	2	10
Liquefaction Hazard (within CGS study zone)[1]	2	2	15	23	15	17	2	5
Earthquake-Induced Landslides (within CGS study zone)[2]	0	4	0	43	2	34	6	11
Earthquake Faulting (within CGS zone)	0	1	0	0	2	2	0	5
Flooding (within 100 year floodplain)	1	0	1	0	3	3	0	1
Flooding (within 500 year floodplain)	1	1	0	7	0	2	0	0
Landslides (within areas of existing landslides)	0	0	0	0	4	7	2	2
Wildfires (subject to high, very high, or extreme wildfire threat)	0	0	3	3	25	25	3	9
Wildland-Urban Interface Fire Threat	0	0	16	6	10	6	2	1
Dam Inundation	0	0	4	4	8	1	0	6
Sea Level Rise (within 16 in inundation zone)	-	0	-	0	-	0	-	0
Sea Level Rise (within 55 in inundation zone)	-	0	-	0	-	0	-	0
Tsunamis[3] (within inundation area)	-	0	-	0	-	0	-	0
Drought[4]	-	-	-	-	-	-	-	-

[1] Two county-owned critical facilities are outside the area that has been evaluated by CGS for this hazard

[2] The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done.

[3] Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

[4] Drought will not affect locally owned facilities directly.

Repetitive Loss Properties

Based on FEMA data, as of March 2, 2011, and information from ABAG (refer to http://quake.abag.ca.gov/mitigation/pickflood.html), there are two repetitive loss properties on record for the unincorporated areas of the County (both residential). As of 2004, the County has had one repetitive loss property in the unincorporated area (residential) that was outside the floodplain.

Other Risks

The County has used HAZUS to depict in map form several additional risks, including distribution of *In Home Supportive Service* (IHSS) cases, estimated concrete, steel debris and highway damage in a Hayward fault earthquake scenario, estimated highway infrastructure damage in a Hayward fault earthquake scenario, estimated impaired hospitals in a Hayward fault earthquake based on hospital beds and highway functionality. These maps, attached as Exhibit C, are used by the Sheriff and Fire Departments for emergency planning purposes. ABAG has evaluated hospitals and infrastructure which are located in areas of high shaking and given that information to the county for each facility. The data is summarized in the Risk Assessment section of this annex.

The County plans to work with ABAG to develop specific information about the kind and level of damage to buildings, infrastructure, and critical facilities which might result from any of the hazards previously noted.

National Flood Insurance Program

The Alameda County PWA Flood Control District (PWAFCD) has participated in the National Flood Insurance Program since 1981. Since 1992, the County has also participated in the Community Rating System and is currently rated Class 7. The County is striving to reach the highest possible rating under the Community Rating System by undertaking additional studies and/or programs such as floodplain analysis and delineation, and rainfall and stream flow monitoring, in addition to complying with all FEMA NFIP requirements.

In June of 2009, the County entered into an agreement with FEMA to become a FEMA Cooperating Technical Partner. PWAFCD has developed a cooperative relationship with FEMA allowing for the sharing of hydrologic/hydraulic data for flood insurance rate maps and detailed topographic data for floodplain map modernization and map corrections.

The PWAFCD's dedicated participation in the program beyond the standard requirements of NFIP's Floodplain Management means property owners of the unincorporated areas of the County who are located within FEMA-designated Special Flood Hazard Areas have been qualified by FEMA for a reduction in their flood insurance premium.

The PWAFCD's currently uses FEMA digital flood insurance rate maps available on the ABAG website at. http://www.abag.ca.gov/bayarea/eqmaps/eqfloods/floods.html. In addition, the County also uses PWAFCD's hydrology and hydraulic studies. Both sources of information are used to assess the flood risk potential that may impact new development.

Alameda County has several existing mitigation strategies aimed at reducing flood losses:

- Balance the housing needs of residents and the need for private commercial and industrial development against the risk from potential flood-related hazards. (HSNG-h-2, ECON-f-2)

- Ensure that new private development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development, or does not increase runoff by draining water to pervious areas or detention facilities. (HSNG-h-3, ECON-f-3)

- Apply floodplain management regulations for private development in the floodplain and floodway. (HSNG-h-6, ECON-f-6)

- Ensure that new subdivisions are designed to reduce or eliminate flood damage by requiring lots and rights-of-way be laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practicable. (HSNG-h-7)

- Encourage home and apartment owners to participate in home elevation programs within flood hazard areas. (HSNG-h-8)

- Require an annual inspection of approved flood-proofed privately-owned buildings to ensure that (a) all flood-proofing components will operate properly under flood conditions and (b) all responsible personnel are aware of their duties and responsibilities as described in their building's Flood Emergency Operation Plan and Inspection & Maintenance Plan. (ECON-f-9).

Mitigation Goals and Objectives

The goal of the ABAG MJ-LHMP is to maintain and enhance a disaster-resistant region by reducing the potential for loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters. This goal remains unchanged for the 2010 plan.

In addition, the County has the specific objective of reducing the number of public and private buildings within the County that are vulnerable to the effects of earthquakes.

Mitigation Activities and Priorities

Evaluation of Progress from the 2007 Annex

In 2006 and 2007, mitigation actions and priorities were identified and incorporated into the 2007 County Annex. The attached list, *Status of 2007-2010 Mitigation Projects,* Exhibit D in the Alameda County 2010 Annex, indicates each of the strategies identified, along with responsible party, action taken, and current status, or result, of mitigation activities undertaken in the previous plan period.

Given that the development of the 2007 Annex was a public process, implementation of the mitigation strategies from that plan also engaged the public. For example, the County's Public Works Agency (PWA) conducted project information meetings to inform the public of the mitigation projects (see Appendix D) and posted project information on the Agency's website. Project information sheets were also mailed to the community in the immediate areas. For projects along Alameda Creek which impacted the Alameda Creek Regional Trail, the East Bay Regional Parks District also posted project information on their website as well.

PWA also engages in Community Rating System outreach efforts on a regular basis. Every year a letter containing information on the National Flood Insurance Program is sent to property owners and renters living within the Special Flood Hazard Areas, as well as to those in the immediate vicinity. When FEMA published the new Flood Insurance Rate Maps in 2009, that information along with the maps' effective dates were also disseminated to the public. Yearly notifications as well as informational brochures are also distributed to local insurance companies, lending institutions, real estate offices and libraries.

For Mitigation projects and activities that were not listed in the 2007 Annex but developed later, public input is also sought. For instance, on a regular basis the Public Health Emergency Planning Coordinator and the Health Officer and others involved in emergency preparedness participate in numerous emergency preparedness planning groups. These groups include internal partners in addition to the public, private, governmental and nongovernmental constituents.

Future Mitigation Actions and Priorities

As a participant in the 2010 ABAG multi-jurisdictional planning process with other jurisdictions, the staff of Alameda County assisted in the development and review of the comprehensive list of mitigation strategies in the overall ABAG multi-jurisdictional plan (**Exhibit F**). The decision on

priority was made based on the STAPLEE criteria, not simply on an economic cost-benefit analysis. These criteria include being socially appropriate, technically and administratively feasible, politically acceptable, legal, economically sound, and not harmful to the environment or our heritage.

Upon completion of ABAG's regional process the County Planning team, utilizing the three-tiered structure noted earlier (see the *Local Planning Process* section) met on a regular basis to review and prioritize specific mitigation tasks for Alameda County in the current plan period (2010-2015). Disaster Mitigation Teams from within the various agencies nominated projects to be included on the list, which were then evaluated by members of the Working Group and senior management members of the Executive Committee. This list, *2010-2015 Mitigation Projects* (**Exhibit E**), includes implementation process, funding strategy, and approximate time frame. Prioritization of the specific mitigation tasks was done using the STAPLEE criteria and then submitted to County Agency Directors and the County Administrator's Office for review and approval. All of the tasks identified appear to have benefits that outweigh the costs of implementation. The draft priorities will be provided to the County Board of Supervisors for adoption pending approval of this LHMP Annex by FEMA.

On-Going Mitigation Strategy Programs

The County has many on-going mitigation programs which help create a more disaster-resistant region. The following list highlights those programs identified as *Existing Programs* in the mitigation strategy spreadsheet. Others are on-going programs that are currently underfunded. It is the County's priority to find additional funding to sustain these on-going programs over time.

- Vulnerability assessments of County facilities and infrastructure (GOVT-a-1) – Ongoing, but underfunded;
- Non-structural mitigation for building contents (GOVT-a-4) – Underfunded;
- Installation of micro and/or surveillance cameras at critical public assets tied to web-based software (GOVT-a-6) – Ongoing, but underfunded;
- The County continues to develop interoperability of communications for first responders via the East Bay Regional Communications Systems and the Communications Interoperability Plan, and coordinates these activities with the State of California. (GOVT-c-7) – Ongoing;
- The County operates under the auspices of SEMS and provides ongoing training for staff when appropriate. (GOVT-c-12) – Ongoing;
- The County operates under the auspices of the Mutual Aid Agreement. (GOVT-c-13);

- The County PWA is going through a FEMA accreditation process for its levees. Part of this process has included the geotechnical evaluation of the levees to determine their stability. The County has received funds from the California Department of Water Resources to help offset the cost of this work. Actual levee rehabilitation work began this year (2010) at 4 locations along the Alameda Creek and Lines B and C (Zone No. 6) levees. Along the creek, work has been already completed at two locations, a third is expected to be completed in the Summer of 2011, and a forth in 2012. Zone 6 work, started as a 3-phase project in 2009, is nearly finished and scheduled for completion in 2011. During the geotechnical evaluation of the County's levee system, these locations were determined to be at risk. This work is expected to be completed in 2012. (Infra-b-2);

- The County conducts watershed analysis to predict areas of insufficient capacity in the storm drain and natural creek systems (INFR-d-1, INFR-d-2, INFR-d-3);

- The County continues to make repairs and structural improvements to the storm drain system as needed to ensure their adequacy to convey the design stormwater flows. (INFR-d-6, INFR-d-7);

- Alameda County participates in FEMA's National Flood Insurance Program and works to reduce flood risk. (GOVT-d-5) ;

- The County has updated the Grading Ordinance (HSNG-h-2, ECON-g-2);

- The County conducts training for Community Emergency Response Teams 6 times a year (GOVT-c-3, ECON-J-5, HSNG-K-6);

- The County has developed Family Plan Templates and posted information on the Public Health website for public and private preparedness for health emergencies (HEAL-a-7);

- Annual inspections of the County's three dams are conducted by the State Division of Safety of Dams. Annual inspection reports are then provided to the County. In addition, the County submits to the State Division of Safety of Dams semi-annual status reports for Cull Creek Dam. This dam has been determined to be at risk during a seismic event. Presently, the County does not have funds available for dam upgrades. In the interim, until funding is secured, a discharge pipe has been added to the outlet works to lower the lake level to reduce flood hazard due to dam failure. (Infra-a-2, Infra-a-13, Infra-b-5).

Incorporation into Existing Planning Mechanisms

The County has a number of planning and operational mechanisms which have had disaster and mitigation concepts incorporated into their development in order to ensure that disaster awareness and mitigation becomes embedded in standard County practice. For example:

- **Alameda County Capital Improvements Plan** (CIP): In order to meet its service and facility requirements in the most responsive and efficient manner possible, the County GSA developed the CIP to identify the County's capital needs and provide a method through which the County can take a planned and programmed approach to development. It is a 5-year projection that indicates timing and estimated cost as well as identifying responsible parties and stakeholders. It is updated annually and includes a number of structural mitigation projects, including the *Highland Hospital Acute Tower Replacement* and the *Peralta Oaks Seismic Retrofit and Reassignment to Sheriff and Healthcare* (see Exhibit E).

- **Alameda County Climate Action Plan:** Recognizing the need to take action now to protect our climate in order to maintain the quality of life in our communities, the Alameda County's Board of Supervisors directed County staff to develop a comprehensive climate protection strategy. The resulting Climate Action Plan provides the blueprint for meeting our greenhouse gas (GHG) reduction goals through specific policies, programs, and actions. Working in conjunction with other local governments, businesses, and residents the Climate Action Plan is comprised of two parts - one covering the unincorporated private sector communities in Alameda County and the other covering County government operations and services. By taking specific steps to reduce our GHG emissions, such as updating mitigation and emergency operations plans related to climatic issues, the County's long-term goal is to reduce our impact on the climate to mitigate against the following:

    - Flooding from sea level rise and increased storm intensities that would otherwise have an impact on local buildings and infrastructure;
    - Water shortages from summer droughts that will impact residential, commercial, and agricultural water users;
    - Increased risk of wildfires from drier conditions;
    - Community health impacts from warmer temperatures that allow tropical and subtropical diseases to spread.

    In addition to the comprehensive strategies in the *Climate Action Plan*, the County has also embarked on complementary initiatives such as the multi-jurisdictional *County and City Climate Coordination* initiative and the nationwide *Cool Counties* initiative (Alameda County is a founding member). The intent is to work with other local

governments across the region and nation to address climate change in our communities. See the County's website for more information at http://acgov.org/sustain/what/climate/index.htm.

Since October 2010, PWA-FCD is also an active participant in a new state program, the "Adapting to Rising Tides" (ART) project which is managed and organized by the San Francisco Bay Conservation and Development Commission (BCDC) in partnership with the National Oceanic and Atmospheric Administration Coastal Services Center (NOAA CSC). The purpose is to examine how sea level rise and other climate change will affect the future of Bay Area communities, ecosystems, infrastructure, and economy. The ART project is working with Bay Area communities to:

- Identify current and future vulnerabilities within a sub-region of the Bay Area.
- Evaluate strategies and tools to support community-based adaptation planning.
- Use the lessons learned to develop a regional adaptation planning process.

The goal of the ART project is to increase the preparedness and resilience of Bay Area communities to sea level rise and other climate change impacts while protecting ecosystem and community services

- **Alameda County Strategic Visioning:** This "broad brush" planning process, which includes senior management and elected officials, first occurred in 2006 and was last updated in 2008. The intent was to chart the County's path and its environmental and economic sustainability over the course of the next 5 years. The plan is a multi-year, comprehensive and far-reaching roadmap for our County with five strategic priorities identified as follows: (1) Environment / Sustainability, (2) Safe and Livable Communities, (3) Healthy and Thriving Populations, (4) Housing, and (5) Transportation. Included in this planning process were natural hazards and their impact in item 2, the *Safe and Livable Communities* section. See the County's website for more information at http://acgov.org/strategic.htm

- **Multi-agency incorporation of mitigation and preparedness concepts into day-to-day operations:** Mitigation planning and cross referencing of the current mitigation plan with daily operations is done to enhance disaster resiliency in various planning efforts as well as in the design, procurement, construction, and maintenance of County facilities and infrastructure. For example…

  - *Corrective Maintenance Inspection and Repair*: As noted above in "On Going Mitigation Strategies Programs", Alameda County's Building Maintenance Department conducts a variety of non-structural mitigation projects as part of its normal operation and maintenance of facilities. This includes, for example, the

bracing and retrofitting of equipment, shelves, cabinets, and piping to make them less susceptible to damage from earthquakes.

- *Inter-Agency Coordination for Private and Public Sector Development*: The Planning Department of Alameda County's Community Development Agency routinely refers projects under consideration for discretionary approval to the Alameda County Public Works Agency, Flood Control and Water Conservation District, and the Fire Department for review and comment to ensure consistency with various ordinances, including but not limited to the Building, Grading, and Watercourse ordinances**.**

- *The Safety Element in the County's General Plan*: This includes a discussion of fire, earthquake, flooding, and landslide hazards. This plan was adopted as an implementation appendix to the Safety Element. In addition, the County enforces the requirements of the California Environmental Quality Act (CEQA), which, since 1988, requires mitigation for identified natural hazards. The Safety Element of the Alameda County General Plan was updated in 2010 in accordance with the California Disaster Assistance Act. Another update is anticipated to begin in 2011.

- *Building Code Ordinance:* Imposes design standards to increase the ability of buildings to better withstand the forces of earthquakes so as to minimize loss of life and property.

- *Grading Ordinance:* Requires grading activities do not create or enhance soil instability, landslides, or erosion.

- *Watercourse Ordinance:* Imposes setbacks on new developments to prevent or lessen the likelihood of property damage due to flooding and to ensure that new creek side development does not occur on unstable creek bank areas.

The County has used these pre-existing programs as a basis for identifying gaps that may lead to disaster vulnerabilities in order to work on ways to address these risks through mitigation.

Plan Update Process

The County General Services Agency will ensure that monitoring of this Annex during the 5-year period will occur. The plan will be monitored on an on-going basis, with members of the Working Group meeting 3 to 4 times a year to ensure ongoing implementation of the mitigation strategies and for coordination with other agencies and departments on specific projects. However, the major disasters affecting our County, legal changes, notices from ABAG as the lead agency in this process, and other triggers will be used. Finally, the Annex will be a

discussion item on the agenda of the meeting of Department leaders at least once a year in April. At that meeting, the department heads will focus on evaluating the Annex in light of technological and political changes during the past year or other significant events. The Department leaders will be responsible for determining if the plan should be updated.

The County is committed to reviewing and updating this plan annex at least once every five years, as required by the Disaster Mitigation Act of 2000. The County General Services Agency Director will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the County again plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted, including the County's Office of Emergency Services. The County will then determine if it will work together with other local jurisdictions to identify another regional forum for developing a multi-jurisdictional plan or develop its own mitigation plan.

The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the County will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics. In addition, given the lack of response from the public in this and previous plans, the County is exploring alternative means of communication and outreach. Among the ideas being considered for the 2015 Annex update are the following:

- *County Library System:* Educational displays at Libraries throughout the county complete with forms for resident input can provide another venue for residents to participate in the development of the plan.

- *County PIO*: Partner with the County Public Information Officer to tap into pre-existing channels of communication.

- *Existing Community Forums*: Participate in Regional Community Advisory Groups, Town Hall meetings at Board of Supervisor districts, and other pre-existing public forums to inform residents about mitigation and how they can get involved.

- *Transit Organizations*: Display information posters at key transit centers, such as Bay Area Rapid Transit stations, bus stations, and similar types of facilities.

County of Alameda

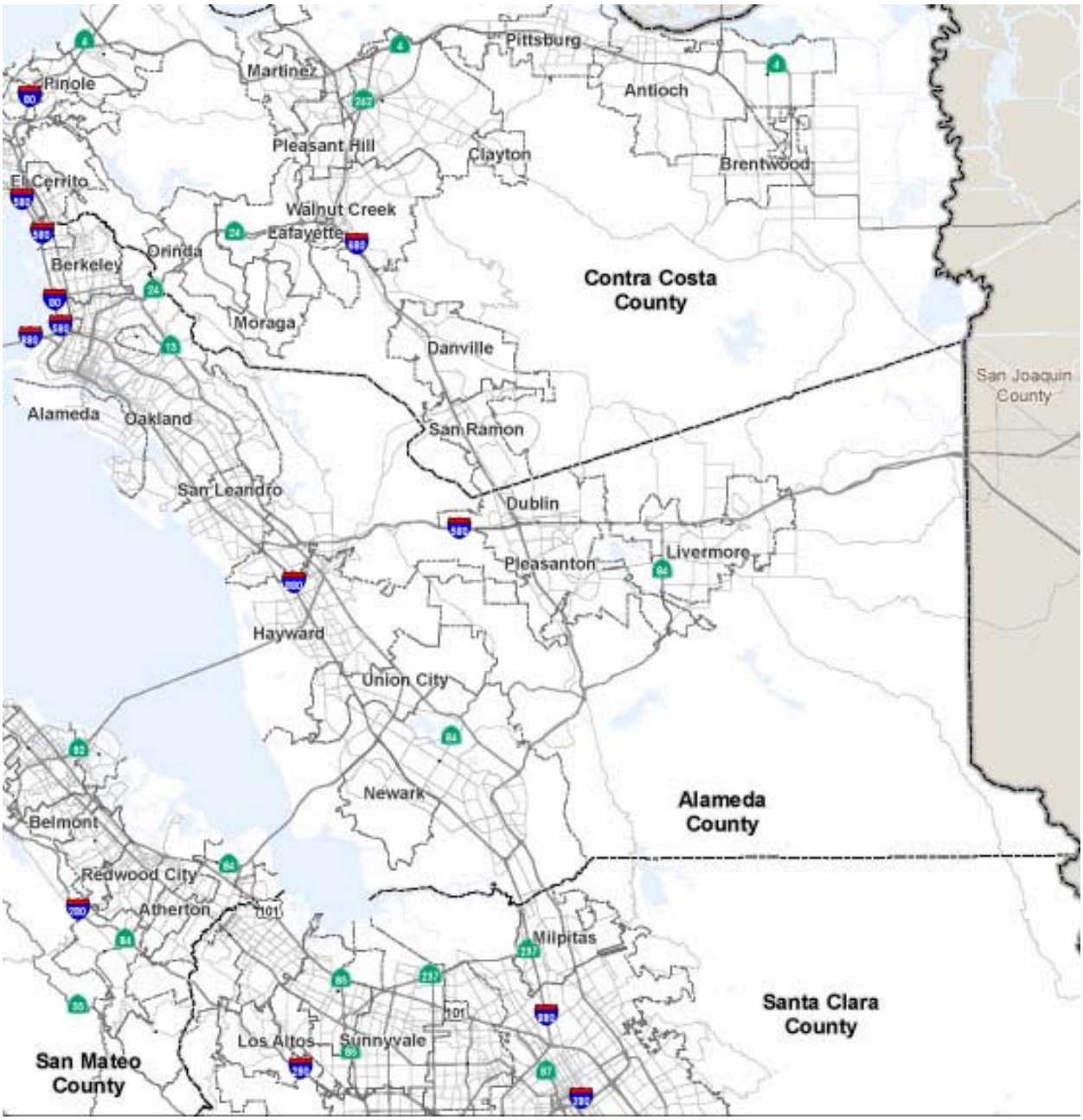
Mitigation Plan Point of Contact

Mitigation Plan Point of Contact
Name: Michael Cadrecha
Title: Architect, General Services Agency
Mailing Address: 1401 Lakeside Drive, Suite 800, Oakland, California 94612
Telephone: 510-208-9589
Email: michael.cadrecha@acgov.org

Alternate Point of Contact
Name: Marla Blagg
Title: Alameda County Fire
Telephone: 510-618-3468
Email: Marla.Blagg@acgov.org

County of Alameda

Exhibit A – Jurisdiction Boundary Map



County of Alameda

Exhibit B – Public Meeting Announcements

(Internet Posting, original text, Sep 2009)

LOCAL HAZARD MITIGATION PLAN

Major natural disasters strike the United States every year causing deaths and injuries to our residents and billions of dollars in property damage. Hurricanes, tornadoes, wildfires, floods, and earthquakes are some of the most common natural disasters we face. We know that the Bay Area will most likely suffer the effects of a major disaster in the coming years.

Disasters are not just events in a single point of time either. Rebuilding and recovery efforts last for many years, sapping the vitality out of local economies by diverting resources from other public and private endeavors. Disasters also have significant impacts on landfills and the environment, as enormous amounts of energy and natural resources are required to rebuild. This in turn stretches our landfills to their limits with the extensive amounts of debris and reconstruction waste generated.

Given the trend towards ever-increasing impacts of natural and human-induced disasters, experts in both the public and private sectors began promoting the concept of pre-disaster mitigation planning. Defined as "sustained activities to reduce or eliminate long-term risk to people and property from hazards and their effects", its purpose is to reduce the potential loss of life, property damage, and environmental degradation from natural disasters and minimize the time and cost of response and recovery.

In light of these developments, the Disaster Mitigation Act of 2000 (Public Law 106-390) was signed into law by President Clinton in October of 2000. It reinforces the importance of mitigation activities at the local government level and emphasizes planning for disasters before they occur. As such, DMA 2000 enshrines pre-disaster hazard mitigation planning as its central core and has requirements for national post-disaster mitigation programs as well. The Act requires all state and local governments to develop a plan based on FEMA guidelines. Key components of a mitigation plan include hazard identification, asset inventory, risk analysis and loss estimation, and a plan to reduce the effects the identified hazards will have. In addition, these plans must be updated periodically with public input.

The following information and links show how Alameda County is working with the Association of Bay Area Governments (ABAG) and other local jurisdictions to update the current plan via ABAG's multi-Jurisdictional Local Hazard Mitigation Plan (MJ-LHMP) for the Bay Area. Public input for Alameda County's plan is encouraged. As such, a public meeting to discuss Alameda County's mitigation strategies will be held on **September 28** from 6pm to 8 pm at 1401 Lakeside Drive, Conference Room 1107, 11th Floor, in Oakland. Here is a map to the location: http://maps.yahoo.com/#mvt=m&lat=37.801157&lon=-122.262897&zoom=17&q1=1401%20Lakeside%20Drive%2C%20oakland%20ca.

- To view the mitigation strategy priorities Alameda County is considering, follow this link http://quake.abag.ca.gov/mitigation/resources.html and click on "New City and County Template.
- http://www.fema.gov/plan/mitplanning/index.shtm
- To learn more about the State of California's FEMA-approved mitigation plan, see http://hazardmitigation.calema.ca.gov/plan/state_multi-hazard_mitigation_plan_shmp
- To see Alameda County's current FEMA-approved plan that was part of ABAG's multi-jurisdictional effort, see http://quake.abag.ca.gov/mitigation/plan.html . Scroll down to "Alameda County Local Governments" and click on Alameda County's "Annex" and "Resolution."
- To see ABAG's informative power point presentation on mitigation, click on this link: http://quake.abag.ca.gov/mitigation/resources.html and scroll down to **NEW** 2009 SAMPLE PowerPoint **Slide Show** on LHMP and Development of LOCAL Mitigation Strategy Priorities.

(*Copy of internet post inviting public input via phone and email – 2 pages; 10/12/10 thru 10/19/10)*

County of Alameda

Page 1 of 1

Alameda County's Official Website

acgov.org

Quick Links Citizens Business Government Emergencies

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Online Services

Online Payments
- Birth, Death, Marriage Certificates
- Business Licenses
- Central Collections Web Pay
- Public Records Copies
- View or Pay Property Taxes
- Traffic Tickets
- Wells Drilling Permit

LIVE! Audio/Video Broadcasts
- Board of Supervisors Meetings
- Planning Commission Meeting

Video
- Importance of Libraries
- Santa Rita Jail Photovoltaic Project
- Voting Videos

Maps
- Election Results Maps
- Board of Supervisors Map
- Community Based Services
- County Geospatial Data Files
- Local Oversight Program (LOP) Records
- Restaurant Inspection Results

Other Services
- Criminal Docket Finder
- Website Survey
- Inmate Locator
- Property Assessment
- Jury Reporting Instructions
- Supplemental Tax Estimator
- Lookup Fictitious Business Names
- Lookup Public Records
- Street Lighting - Questions / Concerns
- GSA Business Outreach Events
- District 5 Community Events
- Redevelopment Meetings
- CDA Planning Meetings
- Fire Department Events

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We Need Poll Workers!!

Alameda County needs poll workers for the November 2, 2010, General Election. Poll Workers are the backbone of our election system. It's an enjoyable and rewarding way to be part of our free democratic process. Apply online today!

Hazard Mitigation Planning

photo by LT. Craig Byron

Major natural disasters strike every year causing deaths and injuries and billions of dollars in damage to property and infrastructure. We know the Bay Area may suffer the effects of a major disaster in the coming years, so preparing now for whatever may come is the surest means of reducing the risks we all face. Learn more and participate in helping Alameda County become more prepared.

Historic Halls Available For Special Events

Rent rooms of various sizes and capacities that are reasonably priced and ideal for: Graduation Parties, Weddings, Receptions, Banquets, or Quinceañeras.

Your County Government

- Board of Supervisors
- County Administrator's Office
- Departments & Agencies
- Fair Political Practice Ticket Reporting Information
- County Budget

Green Corner

Sustainability Website

Alameda County Community Climate Action Plan

Learn more...

Alameda County Resource Directory

Alameda County Strategic Vision

Women's Hall of Fame Alameda County

Doing Business With Us

- Small, Local & Emerging Business Program
- County Contract Compliance System: Elation
- Office of Acquisition Policy
- Awarded/Closed Contracts
- Current Contracting Opportunities
- Upcoming Contracting Opportunities
- Sole Source Procurements
- Vendor Application

Popular Forms

County standard file format is Portable Document Format (PDF). Free Adobe Reader is required.

- Fictitious Business Name Statement
- Informal Request for "Decline in Market Value" Reassessment
- Unrestricted Copy of a Birth Certificate
- Preliminary Change of Ownership Report
- Application For Changed Assessment

More forms...

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10/13/10

Alameda County Hazard Mitigation Planning

Major natural disasters strike the United States every year causing deaths and injuries to our citizens and billions of dollars in damage to property and infrastructure. Wildfires, floods, and earthquakes are some of the most common natural disasters we face. We know the Bay Area may suffer the effects of a major disaster in the coming years, so preparing now for whatever may come is the surest means of reducing the risks we all face.

photo by LT. Craig Byron

Alameda County Local Hazard Mitigation Plan

The rebuilding and recovery efforts following a disaster can last for many years, sapping the vitality out of local economies by diverting resources from other public and private endeavors. Disasters also have significant impacts on landfills and the environment, as debris is generated and enormous amounts of energy and natural resources are required to rebuild. This in turn stretches our landfills to their limits.

Given the trend towards ever-increasing impacts of natural and human-induced disasters, experts in both the public and private sectors began promoting the concept of *pre-disaster mitigation planning*. Defined as "sustained activities to reduce or eliminate long-term risk to people and property from hazards and their effects", the purpose of mitigation planning is to reduce the potential loss of life, property damage, and environmental degradation from natural disasters as well as minimize the time and cost of response and recovery.

In light of these developments, the Disaster Mitigation Act of 2000 (Public Law 106-390) was signed into law by President Clinton in October of 2000. It reinforces the importance of mitigation activities at the state and local government levels and emphasizes planning for disasters *before they occur*. As such, DMA 2000 enshrines pre-disaster hazard mitigation planning as its central core idea and has requirements for national post-disaster mitigation programs as well. The Act requires all state and local governments to develop a plan based on FEMA guidelines. Key components of a mitigation plan include hazard identification, asset inventory, risk analysis, loss estimation, and a plan to reduce the effects the identified hazards will have. In addition, these plans must be updated periodically with public input.

The following information and links show how Alameda County is working with the Association of Bay Area Governments (ABAG) and other local jurisdictions to update the current plan via ABAG's Multi-Jurisdictional Local Hazard Mitigation Plan (MJ-LHMP) for the Bay Area.

Public input for Alameda County's plan Annex is encouraged. As such, citizens are encouraged to review the documents herein and provide their comments and suggestions. To view the County's 2010 Draft Annex and the mitigation strategy priorities we are considering, follow this link… http://quake.abag.ca.gov/mitigation/local-materials.html ...and then follow the link that says Alameda County Draft.

All comments on the Annex should be directed to Michael E. Cadrecha by email or by phone at 510-208-9589.

For general information on mitigation planning, here are some interesting links…

To learn more about pre-disaster mitigation planning, visit FEMA's website at http://www.fema.gov/plan/mitplanning/index.shtm

To see the State of California's FEMA-approved mitigation plan, see http://hazardmitigation.calema.ca.gov/plan/state_multi-hazard_mitigation_plan_shmp

To see Alameda County's current FEMA-approved plan from 2007, see http://quake.abag.ca.gov/mitigation/plan.html. Scroll down to "Alameda County Local Governments" and click on Alameda County's "Annex" and "Resolution."

For a summary list of ABAG's Regional Mitigation Strategies upon which the County's strategies are based, click on this link: http://quake.abag.ca.gov/mitigation/ThePlan-G-Version-August10.pdf (PDF - 214kb) *

* Portable Document Format (PDF) file requires the free Adobe Reader.

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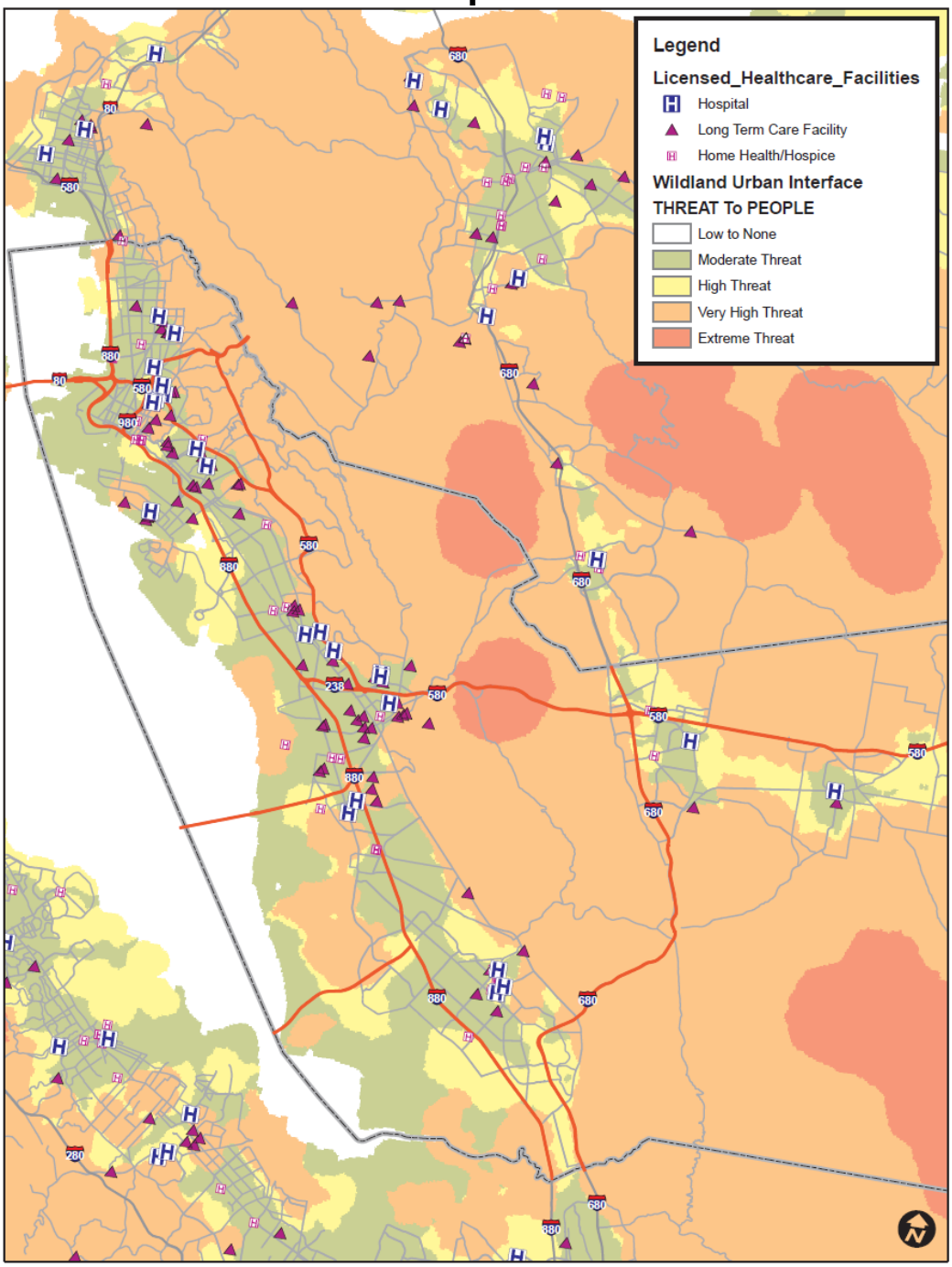
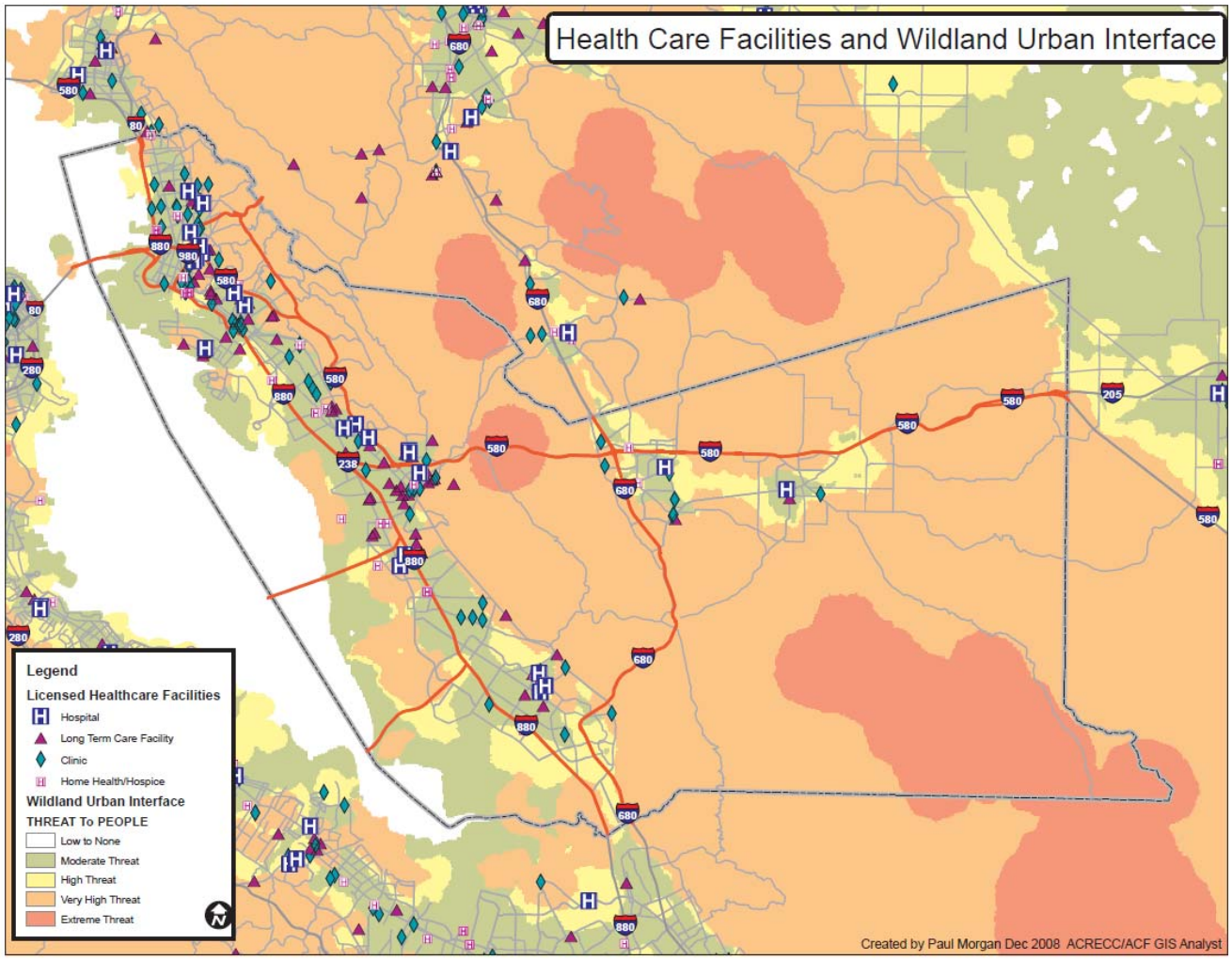
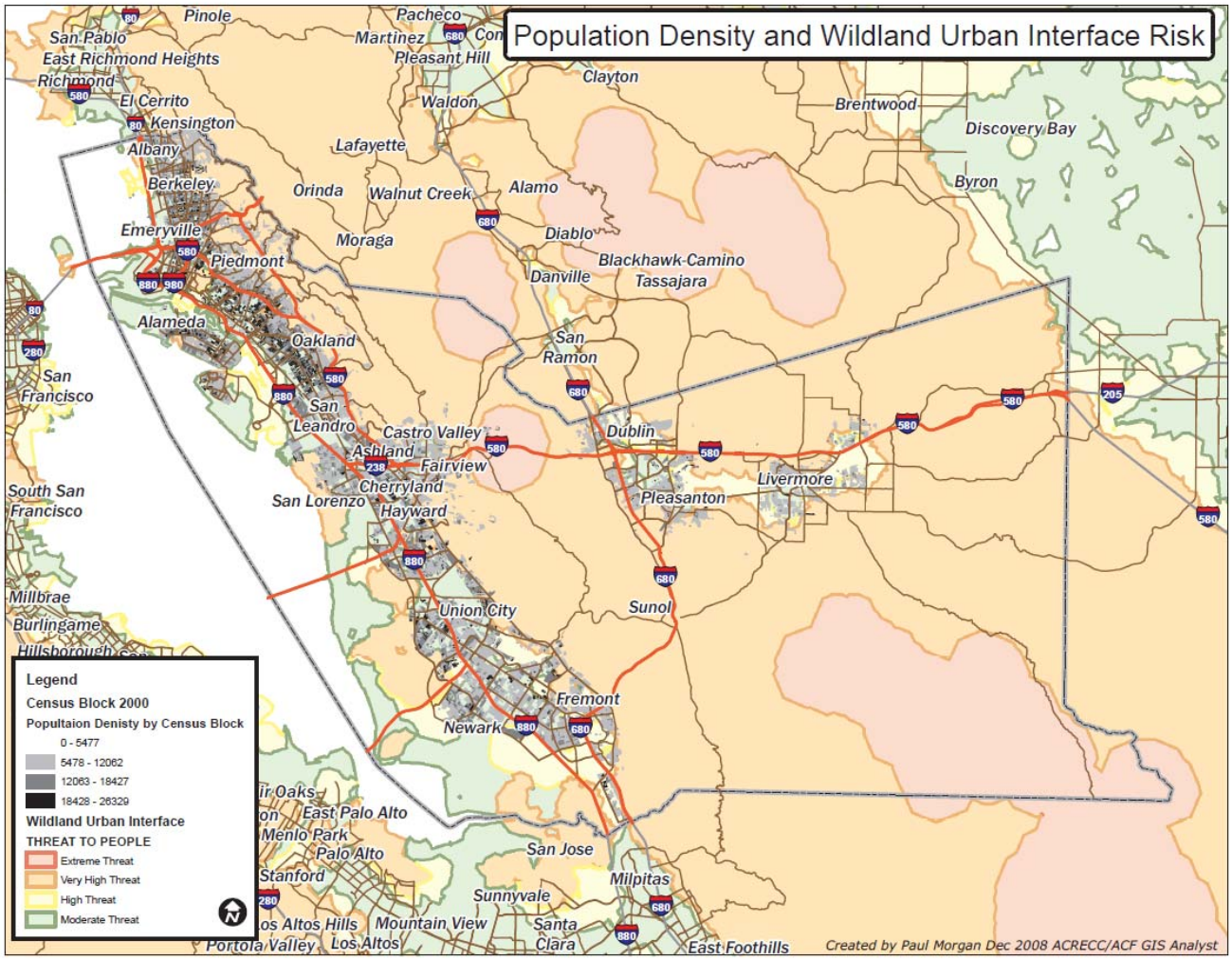
10/13/10

Exhibit C – Additional Maps




Health Care Facilities and Wildland Urban Interface
Legend
Licensed Healthcare Facilities
Hospital
Long Term Care Facility
Clinic
Home Health/Hospice
Wildland Urban Interface
THREAT To PEOPLE
Low to None
Moderate Threat
High Threat
Very High Threat
Extreme Threat
Created by Paul Morgan Dec 2008 ACRECC/ACF GIS Analyst

County of Alameda



County of Alameda

Exhibit D – Evaluation of Mitigation Progress from 2007 Plan

No.	Mitigation Project	2010 MJ-LHMP Strategy Number	Responsible Agency	Action Taken	Status	Comments
1	Seismically Retrofit 3 Fire Stations	GOVT-a-2	GSA and ACFD	Submitted NOI to apply for ARRA (American Recovery and Reinvestment Act of 2009, or "the stimulus") July 2010 for FS 25.	ARRA grant ("stimulus") application not awarded in 2010.	Retrofit FS 24 (old #3), 25 (old #4), & 7 per Seismic Study dated September 2000.
2	Construct 4 new Replacement Fire Stations	GOVT-a-3	GSA and ACFD	Applied for ARRA 2009 Federal Grant	Not funded	Replace FS 22 (old #1), 23 (old #2), & 26 (old #5), and 8 per Seismic Study dated September 2000
3	Pre-Disaster Planning	GOVT-b-2	All Departments	underway	Planning Phase	Develop pre-disaster plans such as COG / COOP Plans, and Post-Disaster Recovery plans.
4	Upgrade the levee system	INFR-b-2	PWA	Underway	Planning grant awarded for design, design complete	Upgrade to Alameda Creek levee system -- construction starts in early August 2010.
5	Conduct a watershed analysis of runoff and drainage systems to predict areas of insufficient capacity in the storm drain and natural creek system.	INFR-d-1, INFR-d-2, INFR-d-3	PWA Flood Control District	Underway	Awarded	Completed Zone Nos. 3A and 4; awarded contract for Zone No. 6; Zone Nos. 2, 2A, 5, 9, 12 & 13 still in planning stage.
6	Continue to repair and make structural improvements to storm drains, pipelines, and/or channels to enable them to perform to their design capacity in handling water flows as part of regular maintenance activities	INFR-d-6, INFR-d-7	PWA Flood Control District	underway	ongoing program	This is financed via County funding.
7	Conduct an inventory of existing or suspected soft-story residential, commercial and industrial structures	HSNG-c-4, ECON-b-4	PWA	On Hold	Awaiting for funding	Due to lack of funding and staff resource, this project has been put on hold.

8	Inventory non-ductile concrete, tilt-up concrete, and other privately-owned structurally suspicious buildings	HSNG-e-2, ECON-d-1	PWA	On Hold	Awaiting for funding	Due to lack of funding and staff resource, this project has been put on hold. This item will be merged with Item #7 for 2010 project.
9	To reduce flood risk, and thereby reduce the cost of flood insurance to property owners, work to qualify for the highest-feasible rating under the Community Rating System of the National Flood Insurance Program	HSNG-h-1, ECON-f-1	PWA Flood Control District	Ongoing	Class 7.	At current class level, 15% reduction for area residents. Should reach Class 6 in the next year or two. Ongoing work in this area is a County standard operating procedure.
10	Increase efforts to reduce landslides and erosion in existing and future development through continuing education of design professionals on mitigation strategies	HSNG-i-2, ECON-g-2	CDA and PWA	Reviewed & enhenced development processes implementing State and Local Ordinances. Developed guidelines for earthwork to reduce erosion and landslide.	DONE	Procedures are in place to enhanced the enforcement of Seismic Hazards Map Act, Alameda County Grading and Erosion Control, and watercourse protection ordinances in the development processes by coordinating with BID and CDA to advise developers and design professionals in the land use entitlement processes to evaluate developments in compliance with regulations. The 1978 Alameda County Grading Ordinance has been updated and was adopted by the County Board of Supervisors (O-2010-19) on May 4, 2010
11	Incorporate FEMA guidelines and suggested activities into local government plans and procedures for managing flood hazards	LAND-c-2	PWA Flood Control District	FEMA flood design guidelines has been incorporated into development process and building permit processes	Ongoing	Procdures are in place to track each building permit and development project in flood zone to ensure proposed project is in compliance with FEMA flood design guidelines and ASCE Standard 24-05 for flood design.
12	Establish and enforce regulations concerning new construction (and major improvements to existing structures) within flood zones in order to be in compliance with federal requirements and, thus, be a participant in the Community Rating System of the National Flood Insurance Program	HSNG-h-7	PWA Flood Control District	FEMA flood design guidelines has been incorporated into development process and building permit processes	Ongoing	Procdures are in place to track each building permit and development project in flood zone to ensure proposed project is in compliance with FEMA flood design guidelines and ASCE Standard 24-05 for flood design. (Same as Item 11 above)

13	Sponsor the formation and training of Community Emergency Response Teams (CERT) through partnerships with local businesses	GOVT-c-3, ECON-j-5, HSNG-k-6	ACFD	CERT program established in 2007	ongoing program	Conduct on average 3 classes/year in district
14	Assist businesses in the development of defensible space through the use of, for example, "tool libraries" for weed abatement tools, roadside collection and/or chipping services (for brush, weeds, and tree branches) in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat	ECON-e-1, HSNG-g-1, HSNG-g-4	ACFD		Deferred.	
15	Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross), conduct workshops, and/or provide outreach encouraging employees of these critical health care facilities to have family disaster plans and conduct mitigation activities in their own homes	HEAL-a-7	PHD	Family plan templates developed and posted on PH website.	ongoing	PH website is being redesigned to included additional resources for public and private agencies. Public Health emergency preparedness program has moved to all hazards planning and response.
16	Continue to develop response plans, exercises, and tools for public and private stakeholders to respond to natural and man made disasters.	HEAL-a-7	PHD	Ongoing	ongoing program	The County's Public Health Dept participates in numerous emergency preparedness planning groups. These groups include internal partners in addition to various public and private sector organizations and constituents. Alameda County BT/Public Health Emergency Response Program is recognized by the CDC and state for its innovative ideas and tool development. Currently products are shared with other health departments in the region.

County of Alameda

Exhibit E – Future Mitigation Projects

No.	Mitigation Project	2010 MJ-LHMP Strategy Number	Applies to New or Existing Assets	Primary Hazard Mitigation Target	Responsible Agencies	Implementation	Estimated Cost	Anticipated Funding Sources	Anticipated Schedule	Comments
1	Seismically Retrofit 3 Fire Stations	GOVT-a-2	Existing	Earthquake	GSA and ACFD	Seismic study completed which identified those fire stations needing retrofit. Design and construction will occur when funding becomes available.	$8.6M	Submitted NOI to apply for Pre Disaster Mitigation Grant July 2010 for FS 25	18 to 24 months for each facilty. Implementation will begin as soon as funding is awarded.	Retrofit Stations 6, 25 (old #4), & 7 per Seismic Study dated September 2000.
2	Construct 4 new Replacement Fire Stations	GOVT-a-2	New	Earthquakes	GSA and ACFD	Seismic study completed which identified those fire stations requiring replacement. Design and construction will occur when funding becomes available.	$30M to $35M	Applied for ARRA 2009 Federal Grant	Implementation will begin as soon as funding is awarded.	Replace FS 22 (old #1), 23 (old #2), & 26 (old #5), and 8 per Seismic Study dated September 2000.

3	Pre-Disaster Planning	GOVT-b-2	New and Existing	All Hazards	All Departments	The County has undertaken a multi-agency effort to increase CERT training and complete numerous plans including medical and disaster operations plans, Debris Management, and Genset Refueling.	To Be Determined on a plan-by-plan basis	Various County agencies and departments will seek appropriate funding	Various plans are under way or planned for the near future.	Develop pre-disaster plans such as COG / COOP Plans, Post-Disaster Recovery, Medical and Health Disaster Ops Plan, PH DOC Plan, Surge/Alternate Care Site (ACS) Plan. In addition, develop Pediatric Disaster and ACS Regional Planning, training conferences, resources, and communications.
4	Conduct an inventory of existing or suspected soft-story, non-ductile concrete, tilt-up concrete, URM, and other publicly and privately-owned structurally suspicious buildings.	HSNG-c-4, ECON-b-4	Existing County-owned facilities and private-sector facilities in the unincorporated sections of Alameda County.	Earthquakes	PWA-BID	County has begun to identify multi-family buildings through Assessor's database and preparing list for buildings to investigate. County believes numbers of URM buildings still needing retrofit to be relatively small.	$200K to $300K	Plan to seek grant through FEMA or other appropriate sources	Implementation will begin as soon as funding is awarded.	County will seek ABAG assistance to identify potentially vulnerable structures and develop a plan for retrofitting them.
5	Conduct training for Community Emergency Response Teams (CERT) through partnerships with local community groups.	GOVT-c-3, ECON-j-5, HSNG-k-6	New and Existing	All Hazards	ACFD	CERT program established in 2007, additional funding needed for on-going training.		Plan to seek grant through FEMA or other appropriate sources	ongoing program	The ACFD conducts on average 6 classes/year within its jurisdiction.

6	Adopt and enforec a repair and reconstruction ordinance to ensure that damaged buildings are repaired in an appropriate and timely manner and retrofitted concurrently.	HSNG-j-1, ECON-i-5, GOVT-a-13	Existing	All Hazards	PWA-BID	County in process of evaluating ordinance	no funding needed	no outside funding needed	Plan to adopt January 2011 with CVC adoption	Language has been adopted and became effective on Jan. 1, 2011
7	Alameda County Acute Care Hospital Tower	GOVT-a-2; HEAL-a-1	New Facility on existing hospital campus	Earthquakes	GSA and HCS	Design complete and construction contract awarded, start construction 2011	$650M-$700M	County funding	Construction duration from 2011 to 2015.	Per California State Assembly Bills 1953 and 306 -- replace existing Acute Care tower with seismically safe facility.
8	Peralta Oaks Seismic Retrofit and Reassignment to Sheriff and Healthcare	GOVT-a-2	Existing	Earthquakes	GSA, ACSO, and PHD	Original tenant has vacated, initial structural analysis and report complete, architectural programming and design underway.	$15M to $18	County funding	Completion projected for Fall 2012	This project, when complete, will house the ACSO Coroner, Crime Lab, and Public Health Lab

9	Update Alameda County Watercourse Protection Ordinance to include provisions to prevent erosion and bank failure caused by flooding to meet FEMA Guidelines	GOVT-d-9	New and Existing	Flooding	PWA-Grading	Rough draft has been prepared. Board-appointed task force is reviewing.	To Be Determined	No funding needed	Expecting long (1+ year) review and approval process. The process to update the Watercourse Protection Ordinance began in 2006. There is no firm expectation as to when the updated ordinance will be completed; although PWA-FCD would like the updated ordinance to be approved by the Board of Supervisors at the earliest time.	There is high sensitivity on the part of the public with regard to the updating of this ordinance. Implementation may significantly affect future development of properties along watercourses. We have received input from the community in the form of comments by the County Board of Supervisors appointed Creeks Task Force. The new Watercourse Protection Ordinance is currently being drafted and will be circulated for initial internal (ACPWA) review.
10	Don Castro reservoir dam & outlet modification.	INFR-b-5, INFR-d-10	Existing	Flooding	PWA Flood Control District	Preliminary studies indicate that the modifications will help reduce sedimentation of the reservoir and reduce peak flows to areas downstream of the dam.	$25M	Plan to seek grant funding from appropriate sources	Final design and then construction to commence once funding has been secured	This project is one component of the County's effort to remove downstream areas along San Lorenzo Creek from FEMA Special Flood Hazard Areas. Currently, there are approximately 2800 properties located within Special Flood Hazard Areas. No available funding at this time.

11	San Lorenzo Creek floodwall.	INFR-d-4, INFR-d-9	Existing	Flooding	PWA Flood Control District	A detailed engineering study is underway to determine the locations and extent of proposed floodwalls to contain the 1% chance flows in San Lorenzo Creek.	$10M	Plan to seek grant funding from appropriate sources	Once the study is completed and funding has been secured, construction of the floodwalls will commence.	This project is one component of the County's effort to remove areas along San Lorenzo Creek from FEMA Special Flood Hazard Areas. No available funding at this time.
12	Alameda Creek Federal Project, Old Alameda Creek levee improvements, and Lines B and C (Zone No. 6) Levees(?)	INFR-d-12	Existing	Flooding	PWA Flood Control District	Engineering and scientific studies are underway to identify ways to improve sediment transport capabilities of these facilities which in turn will improve flood conveyance capacity and reduce potential for flooding.	$20M	Plan to seek grant funding from appropriate sources	The related South Bay Salt Pond Restoration Project is already underway; the channel improvements to be constructed from 2013 to 2015.	This project is related to the ongoing South Bay Salt Pond Restoration Project. The flood control facilities will be hydraulically connected to the former salt production ponds. State acquisition of the Cargill Salt properties and restoration of the salt ponds provided a great opportunity to reduce flood hazard in the nearby urban areas by lowering or breaching the levee systems along the common borders between the salt ponds and flood control channels. Therefore, the District is seeking grants to help reduce flooding and also restore wetland habitat. PWA has contracted with a consultant who is initiating the evaluation of how best to integrate the flood control channels with the restored former salt ponds

13	Cull Creek Dam Retrofit/Upgrade Project	INFR-a-2, INFR-d-10	Existing	Earthquakes and Flooding	PWA	Seismic study has concluded that Cull Creek Dam is seismically unstable. In addition, the flood storage capacity of the reservoir behind the dam is significantly reduced due to sedimentation. PWA-FCD is exploring options to address both seismic and siltation problems.	Preliminary estimated costs are: Dam seismic retrofit ~ $12M Spillway modification ~ $11.5M Sediment removal ~ $13M Fish passage ~ $5.8M Total estimate ~ $42.3M	awaiting funding	Design and construction will commence once funding has been secured.	Due to lack of funding, this project has been put on hold. Measures have been taken to draw down the water level in the reservoir to reduce flood hazard in the event of a seismic event.

County of Alameda

Exhibit F – Regional Mitigation Strategies

[Included on Multi-Jurisdictional Plan CD and at http://quake.abag.ca.gov/mitigation/strategy.html

List of Mitigation Strategies

Number	Specific Mitigation Strategy
Infrastructure: Multi-Hazard	
INFR-a-1	Assess the vulnerability of critical facilities owned by infrastructure operators subject to damage in natural disasters or security threats, including fuel tanks and facilities owned outside of the Bay Area that can impact service delivery within the region. **Note** - Infrastructure agencies, departments, and districts are those that operate transportation and utility facilities and networks.
INFR-a-2	If a dam owner, comply with State of California and federal requirements to assess the vulnerability of dams to damage from earthquakes, seiches, landslides, liquefaction, or security threats.
INFR-a-3	Encourage the cooperation of utility system providers and cities, counties, and special districts, and PG&E to develop strong and effective mitigation strategies for infrastructure systems and facilities.
INFR-a-4	Encourage the cooperation of utility system providers and cities, counties, and special districts, and PG&E to develop strong and effective mitigation strategies for infrastructure systems and facilities.
INFR-a-5	Support and encourage efforts of other (lifeline infrastructure) agencies as they plan for and arrange financing for seismic retrofits and other disaster mitigation strategies. (For example, a city might pass a resolution in support of a transit agency's retrofit program.)
INFR-a-6	Develop a plan for speeding the repair and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies, such as those available through the Water /Wastewater Agency Response Network (WARN). Communicate that plan to local governments and critical facility operators.
INFR-a-7	Engage in, support, and/or encourage research by others (such as USGS, universities, or Pacific Earthquake Engineering Research Center-PEER) on measures to further strengthen transportation, water, sewer, and power systems so that they are less vulnerable to damage in disasters.
INFR-a-8	Pre-position emergency power generation capacity (or have rental/lease agreements for these generators) in critical buildings of cities, counties, and special districts to maintain continuity of government and services.
INFR-a-9	Ensure that critical intersection traffic lights function following loss of power by installing battery back-ups, emergency generators, or lights powered by alternative energy sources such as solar. Proper functioning of these lights is essential for rapid evacuation, such as with hazmat releases resulting from natural disasters.
INFR-a-10	Develop unused or new pedestrian rights-of-way as walkways to serve as additional evacuation routes (such as fire roads in park lands).
INFR-a-11	Minimize the likelihood that power interruptions will adversely impact lifeline utility systems or critical facilities by ensuring that they have adequate back-up power.
INFR-a-12	Encourage replacing above ground electric and phone wires and other structures with underground facilities, and use the planning-approval process to ensure that all new phone and electrical utility lines are installed underground.
INFR-a-13	If you own a dam, coordinate with the State Division of Safety of Dams to ensure an adequate timeline for the maintenance and inspection of dams, as required of dam owners by State law, and communicate this information to local governments and the public.
INFR-a-14	Encourage communication between State Emergency Management Agency (CalEMA), FEMA, and utilities related to emergencies occurring outside of the Bay Area that can affect service delivery in the region.
INFR-a-15	Ensure that transit operators, private ambulance companies, cities, and/or counties have mechanisms in place for medical transport during and after disasters that take into

consideration the potential for reduced capabilities of roads following these same disasters.

INFR-a-16 Recognize that heat emergencies produce the need for non-medical transport of people to cooling centers by ensuring that (1) transit operators have plans for non-medical transport of people during and after such emergencies including the use of paratransit and (2) cities, counties, and transit agencies have developed ways to communicate the plan to the public.

INFR-a-17 Effectively utilize the Regional Transportation Management Center (TMC) in Oakland, the staffing of which is provided by Caltrans, the CHP and MTC. The TMC is designed to maximize safety and efficiency throughout the highway system. It includes the Emergency Resource Center (ERC) which was created specifically for primary planning and procedural disaster management. RESPONSIBLE AGENCY: MTC only.

INFR-a-18 Develop (with the participation of paratransit providers, emergency responders, and public health professionals) plans and procedures for paratransit system response and recovery from disasters.

INFR-a-19 Coordinate with other critical infrastructure facilities to establish plans for delivery of water and wastewater treatment chemicals.

INFR-a-20 Establish plans for delivery of fuel to critical infrastructure providers.

INFR-a-21 As an infrastructure operator, designate a back-up Emergency Operations Center with redundant communications systems.

INFR-a-22 Monitor scientific studies of the Sacramento-San Joaquin Delta and policy decisions related to the long-term disaster resistance of that Delta system to ensure that decisions are made based on comprehensive analysis and in a scientifically-defensible manner. Levee failure due to earthquakes, flooding, and climate change (including sea level rise and more frequent and more severe flooding) are all of concern. The long-term health of the Delta area is critical to the Bay Area's water supply, is essential for the San Francisco Bay and estuary's environmental health, provides recreation opportunities for Bay Area residents, and provides the long-term sustainability of Delta communities. While only part of the Delta is within the nine Bay Area counties covered by this multi-jurisdictional LHMP, the Delta is tied to the infrastructure, water supply, and economy of the Bay Area.

<u>Infrastructure: Earthquakes</u>

INFR-b-1 Expedite the funding and retrofit of seismically-deficient city- and county-owned bridges and road structures by working with Caltrans and other appropriate governmental agencies.

INFR-b-2 Establish a higher priority for funding seismic retrofit of existing transportation and infrastructure systems (such as BART) than for expansion of those systems.

INFR-b-3 Include "areas subject to high ground shaking, earthquake-induced ground failure, and surface fault rupture" in the list of criteria used for determining a replacement schedule for pipelines (along with importance, age, type of construction material, size, condition, and maintenance or repair history).

INFR-b-4 Install specially-engineered pipelines in areas subject to faulting, liquefaction, earthquake-induced landsliding, or other earthquake hazard.

INFR-b-5 Replace or retrofit water-retention structures that are determined to be structurally deficient, including levees, dams, reservoirs and tanks.

INFR-b-6 Install portable facilities (such as hoses, pumps, emergency generators, or other equipment) to allow pipelines to bypass failure zones such as fault rupture areas, areas of liquefaction, and other ground failure areas (using a priority scheme if funds are not available for installation at all needed locations).

INFR-b-7 Install earthquake-resistant connections when pipes enter and exit bridges and work with bridge owners to encourage retrofit of these structures.

INFR-b-8 Comply with all applicable building and fire codes, as well as other regulations (such as state requirements for fault, landslide, and liquefaction investigations in particular mapped areas) when constructing or significantly remodeling infrastructure facilities.

INFR-b-9 Clarify to workers in critical facilities and emergency personnel, as well as to elected officials

and the public, the extent to which the facilities are expected to perform only at a life safety level (allowing for the safe evacuation of personnel) or are expected to remain functional following an earthquake.

INFR-b-10 Develop a water-based transportation "system" across the Bay for use in the event of major earthquakes. Implementation of such a system could prove extremely useful in the event of structural failure of either the road-bridge systems or BART and might serve as an adjunct to existing transportation system elements in the movement of large numbers of people and/or goods.

Infrastructure: Wildfire

INFR-c-1 Ensure a reliable source of water for fire suppression (meeting acceptable standards for minimum volume and duration of flow) for existing and new development.

INFR-c-2 Develop a coordinated approach between fire jurisdictions and water supply agencies to identify needed improvements to the water distribution system, initially focusing on areas of highest wildfire hazard (including wildfire threat areas and in wildland-urban-interface areas).

INFR-c-3 Develop a defensible space vegetation program that includes the clearing or thinning of (a) non-fire resistive vegetation within 30 feet of access and evacuation roads and routes to critical facilities, or (b) all non-native species (such as eucalyptus and pine, but not necessarily oaks) within 30 feet of access and evacuation roads and routes to critical facilities.

INFR-c-4 For new development, ensure all dead-end segments of public roads in high hazard areas have at least a "T" intersection turn-around sufficient for typical wildland fire equipment.

INFR-c-5 For new development, enforce minimum road width of 20 feet with an additional 10-foot clearance on each shoulder on all driveways and road segments greater than 50 feet in length in wildfire hazard areas.

INFR-c-6 Require that development in high fire hazard areas provide adequate access roads (with width and vertical clearance that meet the minimum standards of the *Fire Code* or relevant local ordinance), onsite fire protection systems, evacuation signage, and fire breaks.

INFR-c-7 Ensure adequate fire equipment road or fire road access to developed and open space areas.

INFR-c-8 Maintain fire roads and/or public right-of-way roads and keep them passable at all times.

Infrastructure: Flooding

INFR-d-1 Conduct a watershed analysis of runoff and drainage systems to predict areas of insufficient capacity in the storm drain and natural creek system.

INFR-d-2 Develop procedures for performing a watershed analysis to examine the impact of development on flooding potential downstream, including communities outside of the jurisdiction of proposed projects.

INFR-d-3 Conduct a watershed analysis at least once every ten years unless there is a major development in the watershed or a major change in the Land Use Element of the General Plan of the cities or counties within the watershed.

INFR-d-4 Assist, support, and/or encourage the U.S. Army Corp of Engineers, various Flood Control and Water Conservation Districts, and other responsible agencies to locate and maintain funding for the development of flood control projects that have high cost-benefit ratios (such as through the writing of letters of support and/or passing resolutions in support of these efforts).

INFR-d-5 Pursue funding for the design and construction of storm drainage projects to protect vulnerable properties, including property acquisitions, upstream storage such as detention basins, and channel widening with the associated right-of-way acquisitions, relocations, and environmental mitigations.

INFR-d-6 Continue to repair and make structural improvements to storm drains, pipelines, and/or channels to enable them to perform to their design capacity in handling water flows as part of regular maintenance activities. (This strategy has the secondary benefit of addressing fuel,

chemical, and cleaning product issues.)

INFR-d-7 Continue maintenance efforts to keep storm drains and creeks free of obstructions, while retaining vegetation in the channel (as appropriate) to allow for the free flow of water.

INFR-d-8 Enforce provisions under creek protection, stormwater management, and discharge control ordinances designed to keep watercourses free of obstructions and to protect drainage facilities to conform with the Regional Water Quality Control Board's Best Management Practices.

INFR-d-9 Develop an approach and locations for various watercourse bank protection strategies, including for example, (1) an assessment of banks to inventory areas that appear prone to failure, (2) bank stabilization, including installation of rip rap, or whatever regulatory agencies allow (3) stream bed depth management using dredging, and (4) removal of out-of-date coffer dams in rivers and tributary streams.

INFR-d-10 Use reservoir sediment or reed removal as one way to increase storage for both flood control and water supply.

INFR-d-11 Identify critical locally-owned bridges affected by flooding and either elevate them to increase stream flow and maintain critical ingress and egress routes or modify the channel to achieve equivalent objectives.

INFR-d-12 Provide or support the mechanism to expedite the repair or replacement of levees that are vulnerable to collapse from earthquake-induced shaking or liquefaction, rodents, and other concerns, particularly those protecting critical infrastructure.

INFR-d-13 Ensure that utility systems in new developments are constructed in ways that reduce or eliminate flood damage.

INFR-d-14 Determine whether or not wastewater treatment plants are protected from floods, and if not, investigate the use of flood-control berms to not only protect from stream or river flooding, but also increase plant security.

INFR-d-15 Work cooperatively with water agencies, flood control districts, Caltrans, and local transportation agencies to determine appropriate performance criteria for watershed analysis.

INFR-d-16 Work for better cooperation among the patchwork of agencies managing flood control issues.

INFR-d-17 Improve monitoring of creek and watercourse flows to predict potential for flooding downstream by working cooperatively with land owners and the cities and counties in the watershed.

INFR-d-18 Using criteria developed by EPA for asset management, inventory existing assets, the condition of those assets, and improvements needed to protect and maintain those assets. Capture this information in a Geographic Information System (GIS) and use it to select locations for creek monitoring gauges.

<u>Infrastructure: Landslides</u>

INFR-e-1 Include “areas subject to ground failure” in the list of criteria used for determining a replacement schedule (along with importance, age, type of construction material, size, condition, and maintenance or repair history) for pipelines.

INFR-e-2 Establish requirements in zoning ordinances to address hillside development constraints in areas of steep slopes that are likely to lead to excessive road maintenance or where roads will be difficult to maintain during winter storms due to landsliding.

<u>Infrastructure: Building Reoccupancy</u>

INFR-f-1 Ensure that critical buildings owned or leased by special districts or private utility companies participate in a program similar to San Francisco’s Building Occupancy Resumption Program (BORP). The BORP program permits owners of buildings to hire qualified engineers to create facility-specific post-disaster inspection plans and allows these engineers to become automatically deputized as City/County inspectors for these buildings in the event of an earthquake or other disaster. This program allows rapid reoccupancy of the buildings. Note - A qualified (deleted structural) engineer is a California licensed engineer with relevant experience.

Infrastructure: Public Education

INFR-g-1 Provide materials to the public related to planning for power outages.

INFR-g-2 Provide materials to the public related to family and personal planning for delays due to traffic or road closures, or due to transit system disruption caused by disasters.

INFR-g-3 Provide materials to the public related to coping with reductions in water supply or contamination of that supply BEYOND regulatory notification requirements.

INFR-g-4 Provide materials to the public related to coping with disrupted storm drains, sewage lines, and wastewater treatment (such as materials developed by ABAG's Sewer Smart Program).

INFR-g-5 Facilitate and/or coordinate the distribution of emergency preparedness or mitigation materials that are prepared by others, such as by making the use of the internet or other electronic means, or placing materials on community access channels or in city or utility newsletters, as appropriate.

INFR-g-6 Sponsor the formation and training of Community Emergency Response Teams (CERT) for the employees of your agency. [Note – these programs go by a variety of names in various cities and areas.]

INFR-g-7 Develop and distribute culturally appropriate materials related to disaster mitigation and preparedness, such as those on the http://www.preparenow.org website related to infrastructure issues.

Health: Hospitals and Other Critical Health Care Facilities

HEAL-a-1 Work to ensure that cities, counties, county health departments, and hospital operators coordinate with each other (and that hospitals cooperate with the California Office of Statewide Health Planning and Development - OSHPD) to comply with current state law that mandates that critical facilities are structurally sound and have nonstructural systems designed to remain functional following disasters by 2013. In particular, this coordination should include understanding any problems with obtaining needed funding. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals

HEAL-a-2 Encourage hospitals in your community to work with OSHPD to formalize arrangements with structural engineers to report to the hospital, assess damage, and determine if the buildings can be reoccupied. The program should be similar to San Francisco's Building Occupancy Resumption Program (BORP) that permits owners of buildings to hire qualified structural engineers to create building-specific post-disaster inspection plans and allows these engineers to become automatically deputized as inspectors for these buildings in the event of an earthquake or other disaster. OSHPD, rather than city/county building departments, has the authority and responsibility for the structural integrity of hospital structures. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals

HEAL-a-3 Ensure health care facilities are adequately prepared to care for victims with respiratory problems related to smoke and/or particulate matter inhalation. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals

HEAL-a-4 Ensure these health care facilities have the capacity to shut off outside air and be self-contained. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals

HEAL-a-5 Ensure that hospitals and other major health care facilities have auxiliary water and power sources. RESPONSIBLE AGENCIES: Cities, counties, county health departments, water suppliers, and hospitals

HEAL-a-6 Work to ensure that county health departments work with health care facilities to institute isolation capacity should a need for them arise following a communicable disease epidemic. Isolation capacity varies from a section of the hospital for most communicable diseases to the entire hospital for a major pandemic flu. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals

HEAL-a-7 Develop printed materials, utilize existing materials (such as developed by FEMA, the American Red Cross, and others, including non-profit organizations), conduct workshops, and/or provide outreach encouraging employees of these critical health care facilities to have

family disaster plans and conduct mitigation activities in their own homes. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals

Health: Ancillary Health-Related Facilities

HEAL-b-1 Identify these ancillary facilities in your community. These facilities are not regulated by OSHPD in the same way as hospitals. RESPONSIBLE AGENCIES: Cities, counties, and county health departments

HEAL-b-2 Encourage these facility operators to develop disaster mitigation plans. RESPONSIBLE AGENCIES: Cities, counties, and county health departments

HEAL-b-3 Encourage these facility operators to create, maintain, and/or continue partnerships with local governments to develop response and business continuity plans for recovery. RESPONSIBLE AGENCIES: Cities, counties, and county health departments

Health: Coordination Initiatives

HEAL-c-1 Designate locations for the distribution of antibiotics to large numbers of people should the need arise, as required to be included in each county's Strategic National Stockpile Plan. RESPONSIBLE AGENCIES: County Health Departments

HEAL-c-2 Ensure that you know the Metropolitan Medical Response System (MMRS) cities in your area. Fremont, Oakland, San Francisco, and San Jose (plus Sacramento and Stockton) are the MMRS cities in or near the Bay Area. MMRS cities are provided with additional federal funds for organizing, equipping, and training groups of local fire, rescue, medical, and other emergency management personnel to respond to a mass casualty event. (The coordination among public health, medical, emergency management, coroner, EMS, fire, and law enforcement is a model for all cities and counties.) RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals

HEAL-c-3 Know that National Disaster Medical System (NDMS) uniformed or non-uniformed personnel are within one-to-four hours of your community. These federal resources include veterinary, mortuary, and medical personnel. Teams in or near the Bay Area are headquartered in the cities of Santa Clara and Sacramento. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals

HEAL-c-4 Plan for hazmat related-issues due to a natural or technological disaster. Hazmat teams should utilize the State of California Department of Health Services laboratory in Richmond for confirmation of biological agents and Lawrence Livermore National Laboratory or Sandia (both in Livermore) for confirmation of radiological agents. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals.

HEAL-c-5 Create discussion forums for food and health personnel (including, for example, medical professionals, veterinarians, and plant pathologists) to develop safety, security, and response strategies for food supply contamination (at the source, in processing facilities, in distribution centers, and in grocery stores). RESPONSIBLE AGENCIES: County environmental health departments

HEAL-c-6 Ensure mental health continuity of operations and disaster planning is coordinated among county departments, (including Public Health and Emergency Services), private sector mental health organizations, professional associations, and national and community-based non-profit agencies involved in supporting community mental health programs. First, such planning should ensure that the capability exists to provide both immediate on-site mental health support at facilities such as evacuation centers, emergency shelters, and local assistance centers, as well as to coordinate on-going mental health support during the long-term recovery process. Second, this planning should ensure that mental health providers, in collaboration with the county agencies responsible for providing public information, are prepared to provide consistent post-disaster stress and other mental health guidance to the public impacted by the disaster.

Housing: Multi-Hazard

HSNG-a-1 Assist in ensuring adequate hazard disclosure by working with real estate agents to improve enforcement of real estate disclosure requirements for residential properties with regard to

seven official natural hazard zones: 1) Special Flood Hazard Areas (designated by FEMA), 2) Areas of Potential Flooding from dam failure inundation, 3) Very High Fire Hazard Severity Zones, 4) Wildland Fire Zones, 5) Earthquake Fault Zones (designated under the Alquist-Priolo Earthquake Fault Zoning Act), and the 6) Liquefaction and Landslide Hazard Zones (designated under the Seismic Hazard Mapping Act).

HSNG-a-2 Create incentives for private owners of historic or architecturally significant residential buildings to undertake mitigation to levels that will minimize the likelihood that these buildings will need to be demolished after a disaster, particularly if those alterations conform to the federal Secretary of the Interior's *Guidelines for Rehabilitation.*

HSNG-a-3 Develop a plan for short-term sheltering of residents of your community in conjunction with the American Red Cross.

HSNG-a-4 Develop a plan for interim housing for those displaced by working with the Regional Catastrophic Planning Grant Program (CPGP) that funded this effort in 2009. (Estimated completion is 2011.)

<u>Housing: Single-Family Homes Vulnerable to Earthquakes</u>

HSNG-b-1 Utilize or recommend adoption of a retrofit standard that includes standard plan sets and construction details for voluntary bolting of homes to their foundations and bracing of outside walls of crawl spaces ("cripple" walls), such as Plan Set A developed by a committee representing the East Bay-Peninsula-Monterey Chapters of the International Code Council (ICC), California Building Officials (CALBO), the Structural Engineers Association of Northern California (SEAONC), the Northern California Chapter of the Earthquake Engineering Research Institute (EERI-NC), and ABAG's Earthquake Program.

HSNG-b-2 Require engineered plan sets for seismic retrofitting of heavy two-story homes with living areas over garages, as well as for split level homes (that is, homes not covered by Plan Set A), until standard plan sets and construction details become available.

HSNG-b-3 Require engineered plan sets for seismic retrofitting of homes on steep hillsides (because these homes are not covered by Plan Set A).

HSNG-b-4 Encourage local government building inspectors to take classes on a periodic basis (such as the FEMA-developed training classes offered by ABAG) on retrofitting of single-family homes, including application of Plan Set A.

HSNG-b-5 Encourage private retrofit contractors and home inspectors doing work in your area to take retrofit classes on a periodic basis (such as the FEMA-developed training classes offered by ABAG or additional classes that might be offered by the CALBO Training Institute) on retrofitting of single-family homes.

HSNG-b-6 Conduct demonstration projects on common existing housing types demonstrating structural and nonstructural mitigation techniques as community models for earthquake mitigation.

HSNG-b-7 Provide retrofit classes or workshops for homeowners in your community, or help promote utilization of subregional workshops in the South Bay, East Bay, Peninsula, and North Bay as such workshops become available through outreach using existing community education programs.

HSNG-b-8 Establish tool-lending libraries with common tools needed for retrofitting for use by homeowners with appropriate training.

HSNG-b-9 Provide financial incentives to owners of single-family homes to retrofit if those retrofits comply with Plan Set A or IEBC 2006 in addition to that provided by existing State law that makes such retrofits exempt from increases in property taxes.

<u>Housing: Soft-Story Multi-Family Residential Structures Vulnerable to Earthquakes</u>

HSNG-c-1 Require engineered plan sets for voluntary or mandatory soft-story seismic retrofits by private owners until a standard plan set and construction details become available.

HSNG-c-2 Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory soft-story building retrofits for use in city/county building department regulations. In addition, allow use of changes to that standard recommended by

SEAOC for the 2012 IEBC.

HSNG-c-3 Work to educate building owners, local government staff, engineers, and contractors on privately-owned soft-story retrofit procedures and incentives using materials such as those developed by ABAG and the City of San Jose (see http://quake.abag.ca.gov/eqhouse.html.)

HSNG-c-4 Conduct an inventory of privately-owned existing or suspected soft-story residential structures as a first step in establishing voluntary or mandatory programs for retrofitting these buildings.

HSNG-c-5 Use the soft-story inventory to require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they may live in this type of building.

HSNG-c-6 Use the soft-story inventory to require private owners to inform all existing and prospective tenants that they may need to be prepared to live elsewhere following an earthquake if the building has not been retrofitted.

HSNG-c-7 Investigate and adopt appropriate financial, procedural, and land use incentives (such as parking waivers) for private owners of soft-story buildings to facilitate retrofit such as those described by ABAG (see http://quake.abag.ca.gov/fixit/).

HSNG-c-8 Explore development of State regulations or legislation to require or encourage private owners of soft-story structures to strengthen them.

HSNG-c-9 Provide technical assistance in seismically strengthening privately-owned soft-story structures.

Housing: Unreinforced Masonry Housing Stock

HSNG-d-1 Continue to actively implement existing State law that requires cities and counties to maintain lists of the addresses of unreinforced masonry buildings and inform private property owners that they own this type of hazardous structure.

HSNG-d-2 Accelerate retrofitting of privately-owned unreinforced masonry structures that have not been retrofitted, for example, by (a) actively working with owners to obtain structural analyses of their buildings, (b) helping owners obtain retrofit funding, (c) adopting a mandatory versus voluntary, retrofit program, and/or (d) applying penalties to owners who show inadequate efforts to upgrade these buildings.

HSNG-d-3 Require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they live in an unreinforced masonry building and the standard to which it may have been retrofitted.

HSNG-d-4 As required by State law, require private owners to inform all existing tenants that they may need to be prepared to live elsewhere following an earthquake even if the building has been retrofitted, because it has probably been retrofitted to a life-safety standard, not to a standard that will allow occupancy following major earthquakes.

Housing: Other Privately-Owned Structurally Vulnerable Residential Buildings and Earthquakes

HSNG-e-1 Identify and work toward tying down mobile homes used as year-round permanent residences using an appropriate cost-sharing basis (for example, 75% grant, 25% owner).

HSNG-e-2 Inventory non-ductile concrete, tilt-up concrete (such as converted lofts), and other privately-owned potentially structurally vulnerable residential buildings.

HSNG-e-3 Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory retrofit of privately-owned seismically vulnerable buildings.

HSNG-e-4 Adopt one or more of the following strategies as incentives to encourage retrofitting of privately-owned seismically vulnerable residential buildings: (a) waivers or reductions of permit fees, (b) below-market loans, (c) local tax breaks, (d) grants to cover the cost of retrofitting or of a structural analysis, (e) land use (such as parking requirement waivers) and procedural incentives, or (f) technical assistance.

Housing: New Construction and Earthquakes

HSNG-f-1 Continue to require that all new housing be constructed in compliance with requirements of the most recently adopted version of the *California Building Code*.

HSNG-f-2 Conduct appropriate employee training and support continued education to ensure enforcement of building codes and construction standards, as well as identification of typical design inadequacies of housing and recommended improvements.

Housing: Wildfire and Structural Fires

HSNG-g-1 Increase efforts to reduce hazards in existing private development in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat through improving engineering design and vegetation management for mitigation, appropriate code enforcement, and public education on defensible space mitigation strategies.

HSNG-g-2 Tie public education on defensible space and a comprehensive defensible space ordinance to a field program of enforcement.

HSNG-g-3 Require that new homes in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat be constructed of fire-resistant building materials (including roofing and exterior walls) and incorporate fire-resistant design features (such as minimal use of eaves, internal corners, and open first floors) to increase structural survivability and reduce ignitability. Note - See Structural Fire Prevention Field Guide for Mitigation of Wildfires at http://osfm.fire.ca.gov/structural.html.

HSNG-g-4 Create or identify “model” properties showing defensible space and structural survivability in neighborhoods that are wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat.

HSNG-g-5 Consider fire safety, evacuation, and emergency vehicle access when reviewing proposals to add secondary units or additional residential units in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat.

HSNG-g-6 Adopt and amend as needed updated versions of the *California Building* and *Fire Codes* so that optimal fire-protection standards are used in construction and renovation projects of private buildings.

HSNG-g-7 Create a mechanism to enforce provisions of the *California Building* and *Fire Codes* and other local codes that require the installation of smoke detectors and fire-extinguishing systems on existing residential buildings by making installation a condition of (a) finalizing a permit for any work valued at over a fixed amount and/or (b) on any building over 75 feet in height, and/or (b) as a condition for the transfer of property.

HSNG-g-8 Work to ensure a reliable source of water for fire suppression in rural-residential areas through the cooperative efforts of water districts, fire districts, and residents.

HSNG-g-9 Expand vegetation management programs in wildland-urban- interface fire-threatened communities or in areas exposed to high-to-extreme fire threat to more effectively manage the fuel load through roadside collection and chipping, mechanical fuel reduction equipment, selected harvesting, use of goats or other organic methods of fuel reduction, and selected use of controlled burning.

HSNG-g-10 Establish special funding mechanisms (such as Fire Hazard Abatement Districts or regional bond funding) to fund reduction in fire risk of existing properties through vegetation management that includes reduction of fuel loads, use of defensible space, and fuel breaks.

HSNG-g-11 Work with residents in rural-residential areas to ensure adequate plans are developed for appropriate access and evacuation in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat. For example, in some areas, additional roads can be created, and in other areas, the communities will need to focus on early warning and evacuation because additional roads are not feasible.

HSNG-g-12 Require fire sprinklers in new homes located more than 1.5 miles or a 5-minute response time from a fire station or in an identified high hazard wildland-urban-interface wildfire area.

HSNG-g-13 Require fire sprinklers in all new or substantially remodeled multifamily housing, regardless of distance from a fire station.

HSNG-g-14 Require sprinklers in all mixed use development to protect residential uses from fires started in non-residential areas.

HSNG-g-15 Compile a list of privately-owned high-rise and high-occupancy buildings which are deemed, due to their age or construction materials, to be particularly susceptible to fire hazards, and determine an expeditious timeline for the fire-safety inspection of all such structures.

HSNG-g-16 Conduct periodic fire-safety inspections of all multi-family buildings, as required by State law.

HSNG-g-17 Ensure that city/county-initiated fire-preventive vegetation-management techniques and practices for creek sides and high-slope areas do not contribute to the landslide and erosion hazard. For example, vegetation in these sensitive areas could be thinned, rather than removed, or replanted with less flammable materials. When thinning, the non-native species should be removed first. Other options would be to use structural mitigation, rather than vegetation management in the most sensitive areas.

HSNG-g-18 Create a mechanism to require the bracing of water heaters and flexible couplings on gas appliances, and/or (as specified under **"b. Single-family homes vulnerable to earthquakes"** above) the bolting of homes to their foundations and strengthening of cripple walls to reduce fire ignitions due to earthquakes.

HSNG-g-19 Work with the State Fire Marshall, the California Seismic Safety Commission, Pacific Earthquake Engineering Research Center (PEER), and other experts to identify and manage gas-related fire risks of soft-story residential or mixed use buildings that are prone to collapse and occupant entrapment consistent with the natural gas safety recommendations of Seismic Safety Commission Report SSC-02-03. **Note** - See http://www.seismic.ca.gov/pub/CSSC_2002-03_Natural%20Gas%20Safety.pdf. **Also note** - any valves that are installed may need to have both excess flow and seismic triggers (hybrid valves).

HSNG-g-20 Work with insurance companies to create a public/private partnership to give a discount on fire insurance premiums to Forester Certified Fire Wise landscaping and fire-resistant building materials on private property.

Housing: Flooding

HSNG-h-1 To reduce flood risk, thereby reducing the cost of flood insurance to private property owners, work to qualify for the highest-feasible rating under the Community Rating System of the National Flood Insurance Program.

HSNG-h-2 Balance the housing needs of residents against the risk from potential flood-related hazards.

HSNG-h-3 Ensure that new private development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development, or does not increase runoff by draining water to pervious areas or detention facilities.

HSNG-h-4 Provide sandbags and plastic sheeting to residents in anticipation of rainstorms, and deliver those materials to vulnerable populations upon request.

HSNG-h-5 Provide public information on locations for obtaining sandbags and/or deliver those sandbags to those various locations throughout a city and/or county prior to and/or during the rainy season.

HSNG-h-6 Apply floodplain management regulations for private development in the floodplain and floodway.

HSNG-h-7 Ensure that new subdivisions are designed to reduce or eliminate flood damage by requiring lots and rights-of-way be laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practicable.

HSNG-h-8 Encourage home and apartment owners to participate in home elevation programs within flood hazard areas.

HSNG-h-9 As funding opportunities become available, encourage home and apartment owners to participate in acquisition and relocation programs for areas within floodways.

HSNG-h-10 Encourage owners of properties in a floodplain to consider purchasing flood insurance. For example, point out that most homeowners' insurance policies do not cover a property for flood damage.

Housing: Landslides and Erosion

HSNG-i-1 Increase efforts to reduce landslides and erosion in existing and future development by improving appropriate code enforcement and use of applicable standards for private property, such as those appearing in the California Building Code, California Geological Survey *Special Report 117 – Guidelines for Evaluating and Mitigating Seismic Hazards in California*, American Society of Civil Engineers (ASCE) report *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California*, and the California Board for Geologists and Geophysicists *Guidelines for Engineering Geologic Reports.* Such standards should cover excavation, fill placement, cut-fill transitions, slope stability, drainage and erosion control, slope setbacks, expansive soils, collapsible soils, environmental issues, geological and geotechnical investigations, grading plans and specifications, protection of adjacent properties, and review and permit issuance.

HSNG-i-2 Increase efforts to reduce landslides and erosion in existing and future private development through continuing education of design professionals on mitigation strategies.

Housing: Building Reoccupancy

HSNG-j-1 Develop and enforce a repair and reconstruction ordinance to ensure that damaged buildings are repaired in an appropriate and timely manner and retrofitted concurrently. This repair and reconstruction ordinance should apply to all public and private buildings, and also apply to repair of all damage, regardless of cause. See http://quake.abag.ca.gov/recovery/info-repair-ord.html.

HSNG-j-2 Establish preservation-sensitive measures for the repair and reoccupancy of historically significant privately-owned structures, including requirements for temporary shoring or stabilization where needed, arrangements for consulting with preservationists, and expedited permit procedures for suitable repair or rebuilding of historically or architecturally valuable structures.

Housing: Public Education

HSNG-k-1 Provide information to residents of your community on the availability of interactive hazard maps showing your community on ABAG's web site.

HSNG-k-2 Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross), conduct workshops, and/or provide outreach encouraging residents to have family disaster plans that include drop-cover-hold earthquake drills, fire and storm evacuation procedures, and shelter-in-place emergency guidelines.

HSNG-k-3 Inform residents of comprehensive mitigation activities, including elevation of appliances above expected flood levels, use of fire-resistant roofing and defensible space in high wildfire threat and wildfire-urban-interface areas, structural retrofitting techniques for older homes, and use of intelligent grading practices through workshops, publications, and media announcements and events.

HSNG-k-4 Develop a public education campaign on the cost, risk, and benefits of earthquake, flood, and other hazard insurance as compared to mitigation.

HSNG-k-5 Use disaster anniversaries, such as April (the 1906 earthquake), September (9/11), and October (Loma Prieta earthquake and Oakland Hills fire), to remind the public of safety and security mitigation activities.

HSNG-k-6 Sponsor the formation and training of Community Emergency Response Teams (CERT) for residents in your community. [Note – these programs go by a variety of names in various cities and areas.]

HSNG-k-7 Include flood fighting technique session based on California Department of Water Resources training to the list of available public training classes offered by CERT.

HSNG-k-8 Institute the neighborhood watch block captain and team programs outlined in the Citizen Corps program guide.

HSNG-k-9 Assist residents in the development of defensible space through the use of, for example, "tool libraries" for weed abatement tools, roadside collection and/or chipping services (for brush, weeds, and tree branches) in wildland-urban-interface fire-threatened communities or in

areas exposed to high-to-extreme fire threat.

HSNG-k-10 Train homeowners to locate and shut off gas valves if they smell or hear gas leaking.

HSNG-k-11 Develop a program to provide at-cost NOAA weather radios to residents of flood hazard areas that request them, with priority to neighborhood watch captains and others trained in their use.

HSNG-k-12 Make use of the materials on the ABAG web site at http://quake.abag.ca.gov/fixit and other web sites to increase residential mitigation activities related to earthquakes. (ABAG plans to continue to improve the quality of those materials over time.)

HSNG-k-13 Develop a "Maintain-a-Drain" campaign, similar to that of the City of Oakland, encouraging private businesses and residents to keep storm drains in their neighborhood free of debris.

HSNG-k-14 Encourage the formation of a community- and neighborhood-based approach to wildfire education and action through local Fire Safe Councils and the *Fire Wise Program*. This effort is important because grant funds are currently available to offset costs of specific council-supported projects.

HSNG-k-15 Inform shoreline-property owners of the possible long-term economic threat posed by rising sea levels.

HSNG-k-16 Distribute appropriate materials related to disaster mitigation and preparedness to residents. Appropriate materials are (1) culturally appropriate and (2) suitable for special needs populations. For example, such materials are available on the http://www.preparenow.org website and from non-governmental organizations that work with these communities on an on-going basis.

Economy: Multi-Hazard

ECON-a-1 Assist in ensuring adequate hazard disclosure by working with real estate agents to improve enforcement of real estate disclosure requirements for commercial and industrial properties with regard to seven official natural hazard zones: 1) Special Flood Hazard Areas (designated by FEMA), 2) Areas of Potential Flooding from dam failure inundation, 3) Very High Fire Hazard Severity Zones, 4) Wildland Fire Zones, 5) Earthquake Fault Zones (designated under the Alquist-Priolo Earthquake Fault Zoning Act), and the 6) Liquefaction and Landslide Hazard Zones (designated under the Seismic Hazard Mapping Act).

ECON-a-2 Create incentives for private owners of historic or architecturally significant commercial and industrial buildings to undertake mitigation to levels that will minimize the likelihood that these buildings will need to be demolished after a disaster, particularly if those alterations conform to the federal Secretary of the Interior's *Guidelines for Rehabilitation*.

Economy: Soft-Story Commercial Buildings Vulnerable to Earthquakes

ECON-b-1 Require engineered plan sets for voluntary or mandatory soft-story seismic retrofits by private owners until a standard plan set and construction details become available.

ECON-b-2 Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory soft-story building retrofits for use in city/county building department regulations. In addition, allow use of changes to that standard recommended by SEAOC for the 2012 IEBC.

ECON-b-3 Work to educate building owners, local government staff, engineers, and contractors on privately-owned soft-story retrofit procedures and incentives using materials such as those developed by ABAG and the City of San Jose (see http://quake.abag.ca.gov/eqhouse.html.)

ECON-b-4 Conduct an inventory of privately-owned existing or suspected soft-story commercial or industrial structures as a first step in establishing voluntary or mandatory programs for retrofitting these buildings.

ECON-b-5 Use the soft-story inventory to require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they may work in this type of building.

ECON-b-6 Use the soft-story inventory to require private owners to inform all existing and prospective tenants that they may need to be prepared to work elsewhere following an earthquake if the

building has not been retrofitted.

ECON-b-7 Investigate and adopt appropriate financial, procedural, and land use incentives (such as parking waivers) for private owners of soft-story buildings to facilitate retrofit such as those described by ABAG (see http://quake.abag.ca.gov/fixit).

ECON-b-8 Explore development of State regulations or legislation to require or encourage private owners of soft-story structures to strengthen them.

ECON-b-9 Provide technical assistance in seismically strengthening privately-owned soft-story structures.

Economy: Unreinforced Masonry Buildings in Older Downtown Areas

ECON-c-1 Continue to actively implement existing State law that requires cities and counties to maintain lists of the addresses of unreinforced masonry buildings and inform private property owners that they own this type of hazardous structure.

ECON-c-2 Accelerate retrofitting of privately-owned unreinforced masonry structures that have not been retrofitted, for example, by (a) actively working with owners to obtain structural analyses of their buildings, (b) helping owners obtain retrofit funding, (c) adopting a mandatory (rather than voluntary) retrofit program, and/or (d) applying penalties to owners who show inadequate efforts to upgrade these buildings.

ECON-c-3 Require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they work in an unreinforced masonry building and the standard to which it may have been retrofitted.

ECON-c-4 As required by State law, require private owners to inform all existing tenants that they may need to be prepared to work elsewhere following an earthquake even if the building has been retrofitted, because it has probably been retrofitted to a life-safety standard, not to a standard that will allow occupancy following major earthquakes.

Economy: Privately-Owned Structurally Vulnerable Buildings

ECON-d-1 Inventory non-ductile concrete, tilt-up concrete, and other privately-owned structurally vulnerable buildings.

ECON-d-2 Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory retrofit of privately-owned seismically vulnerable buildings.

ECON-d-3 Adopt one or more of the following strategies as incentives to encourage retrofitting of privately-owned seismically vulnerable commercial and industrial buildings: (a) waivers or reductions of permit fees, (b) below-market loans, (c) local tax breaks, (d) grants to cover the cost of retrofitting or of a structural analysis, (e) land use (such as parking requirement waivers) and procedural incentives, or (f) technical assistance.

Economy: Wildfire and Structural Fires

ECON-e-1 Increase efforts to reduce hazards in existing private development in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat through improving engineering design and vegetation management for mitigation, appropriate code enforcement, and public education on defensible space mitigation strategies.

ECON-e-2 Tie public education on defensible space and a comprehensive defensible space ordinance to a field program of enforcement.

ECON-e-3 Require that new privately-owned business and office buildings in high fire hazard areas be constructed of fire-resistant building materials and incorporate fire-resistant design features (such as minimal use of eaves, internal corners, and open first floors) to increase structural survivability and reduce ignitability.

ECON-e-4 Adopt and amend as needed updated versions of the *California Building* and *Fire Codes* so that optimal fire-protection standards are used in construction and renovation projects of private buildings.

ECON-e-5 Create a mechanism to enforce provisions of the *California Building* and *Fire Codes* and other local codes that require the installation of smoke detectors and fire-extinguishing systems on existing privately-owned buildings by making installation a condition of (a)

finalizing a permit for any work valued at over a fixed amount and/or (b) on any building over 75 feet in height, and/or (b) as a condition for the transfer of property.

ECON-e-6 Expand vegetation management programs in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat to more effectively manage the fuel load through roadside collection and chipping, mechanical fuel reduction equipment, selected harvesting, use of goats or other organic methods of fuel reduction, and selected use of controlled burning.

ECON-e-7 Establish special funding mechanisms (such as Fire Hazard Abatement Districts or regional bond funding) to fund reduction in fire risk of existing properties through vegetation management that includes reduction of fuel loads, use of defensible space, and fuel breaks.

ECON-e-8 Establish special funding mechanisms (such as Fire Hazard Abatement Districts or regional bond funding) to fund fire-safety inspections of private properties, roving firefighter patrols on high fire-hazard days, and public education efforts.

ECON-e-9 Compile a list of privately-owned high-rise and high-occupancy buildings that are deemed, due to their age or construction materials, to be particularly susceptible to fire hazards, and determine an expeditious timeline for the fire-safety inspection of all such structures.

ECON-e-10 Conduct periodic fire-safety inspections of all privately-owned commercial and industrial buildings.

ECON-e-11 Work with the State Fire Marshall, the California Seismic Safety Commission, Pacific Earthquake Engineering Research Center (PEER), and other experts to identify and manage gas-related fire risks of privately-owned soft-story mixed use buildings that are prone to collapse and occupant entrapment consistent with the natural gas safety recommendations of Seismic Safety Commission Report SSC-02-03. Note - See http://www.seismic.ca.gov/pub/CSSC_2002-03_Natural%20Gas%20Safety.pdf. Also note - any valves that are installed may need to have both excess flow and seismic triggers (hybrid valves).

ECON-e-12 Ensure that city/county-initiated fire-preventive vegetation-management techniques and practices for creek sides and high-slope areas do not contribute to the landslide and erosion hazard.

ECON-e-13 Work with insurance companies to create a public/private partnership to give a discount on fire insurance premiums to Forester Certified *Fire Wise* landscaping and fire-resistant building materials on private property.

Economy: Flooding

ECON-f-1 To reduce flood risk, thereby reducing the cost of flood insurance to private property owners, work to qualify for the highest-feasible rating under the Community Rating System of the National Flood Insurance Program.

ECON-f-2 Balance the needs for private commercial and industrial development against the risk from potential flood-related hazards.

ECON-f-3 Ensure that new private development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development, or does not increase runoff by draining water to pervious areas or detention facilities.

ECON-f-4 Provide sandbags and plastic sheeting to private businesses in anticipation of rainstorms, and deliver those materials to vulnerable populations upon request.

ECON-f-5 Provide information to private business on locations for obtaining sandbags and deliver those sandbags to those various locations throughout a city and/or county.

ECON-f-6 Apply floodplain management regulations for private development in the floodplain and floodway.

ECON-f-7 Encourage private business owners to participate in building elevation programs within flood hazard areas.

ECON-f-8 As funding becomes available, encourage private business owners to participate in acquisition and relocation programs for areas within floodways.

ECON-f-9 Require an annual inspection of approved flood-proofed privately-owned buildings to ensure that (a) all flood-proofing components will operate properly under flood conditions and (b) all responsible personnel are aware of their duties and responsibilities as described in their building's *Flood Emergency Operation Plan* and *Inspection & Maintenance Plan*.

Economy: Landslides and Erosion

ECON-g-1 Increase efforts to reduce landslides and erosion in existing and future development by improving appropriate code enforcement and use of applicable standards for private property, such as those appearing in the California Building Code, California Geological Survey *Special Report 117 – Guidelines for Evaluating and Mitigating Seismic Hazards in California*, American Society of Civil Engineers (ASCE) report *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California*, and the California Board for Geologists and Geophysicists *Guidelines for Engineering Geologic Reports*. Such standards should cover excavation, fill placement, cut-fill transitions, slope stability, drainage and erosion control, slope setbacks, expansive soils, collapsible soils, environmental issues, geological and geotechnical investigations, grading plans and specifications, protection of adjacent properties, and review and permit issuance.

ECON-g-2 Increase efforts to reduce landslides and erosion in existing and future private development through continuing education of design professionals on mitigation strategies.

Economy: Construction

ECON-h-1 Continue to require that all new privately-owned commercial and industrial buildings be constructed in compliance with requirements of the most recently adopted version of the *California Building Code*.

ECON-h-2 Conduct appropriate employee training and support continued education to ensure enforcement of construction standards for private development.

ECON-h-3 Work with private building owners to help them recognize that many strategies that increase earthquake resistance also decrease damage in an explosion. In addition, recognize that ventilation systems can be designed to contain airborne biological agents.

Economy: Building Reoccupancy

ECON-i-1 Institute a program to encourage owners of private builldings to participate in a program similar to San Francisco's Building Occupancy Resumption Program (BORP). This program permits owners of private buildings to hire qualified structural engineers to create building-specific post-disaster inspection plans and allows these engineers to become automatically deputized as City/County inspectors for these buildings in the event of an earthquake or other disaster.

ECON-i-2 Actively notify private owners of historic or architecturally significant buildings of the availability of the local BORP-type program and encourage them to participate to ensure that appropriately qualified structural engineers are inspecting their buildings, thus reducing the likelihood that the buildings will be inappropriately evaluated following a disaster.

ECON-i-3 Actively notify owners of educational facility buildings of the availability of the local BORP-type program and encourage them to participate to ensure that appropriately qualified structural engineers are inspecting their buildings, thus reducing the likelihood that the buildings will be inappropriately evaluated following a disaster.

ECON-i-4 Allow private building owners to participate in a BORP-type program as described above, but not actively encourage them to do so.

ECON-i-5 Develop and enforce a repair and reconstruction ordinance to ensure that damaged buildings are repaired in an appropriate and timely manner and retrofitted concurrently. This repair and reconstruction ordinance should apply to all public and private buildings, and also apply to repair of all damage, regardless of cause. See http://quake.abag.ca.gov/recovery/info-repair-ord.html.

ECON-i-6 Establish preservation-sensitive measures for the repair and reoccupancy of historically significant privately-owned structures, including requirements for temporary shoring or

stabilization where needed, arrangements for consulting with preservationists, and expedited permit procedures for suitable repair or rebuilding of historically or architecturally valuable structures.

Economy: Public Education

ECON-j-1 Provide information to private business owners and their employees on the availability of interactive hazard maps on ABAG's web site.

ECON-j-2 Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross), conduct workshops, and/or provide outreach encouraging private businesses' employees to have family disaster plans that include drop-cover-hold earthquake drills, fire and storm evacuation procedures, and shelter-in-place emergency guidelines.

ECON-j-3 Develop and print materials, conduct workshops, and provide outreach to Bay Area private businesses focusing on business continuity planning.

ECON-j-4 Inform Bay Area private business owners of mitigation activities, including elevation of appliances above expected flood levels, use of fire-resistant roofing and defensible space in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat, structural retrofitting techniques for older buildings, and use of intelligent grading practices through workshops, publications, and media announcements and events.

ECON-j-5 Sponsor the formation and training of Community Emergency Response Teams (CERT) training for other than your own employees through partnerships with local private businesses. [Note – these programs go by a variety of names in various cities and areas.]

ECON-j-6 Assist private businesses in the development of defensible space through the use of, for example, "tool libraries" for weed abatement tools, roadside collection and/or chipping services (for brush, weeds, and tree branches) in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat.

ECON-j-7 Make use of the materials developed by others (such as found on ABAG's web site at http://quake.abag.ca.gov/business) to increase mitigation activities related to earthquakes by groups other than your own agency. ABAG plans to continue to improve the quality of those materials over time.

ECON-j-8 Develop a "Maintain-a-Drain" campaign, similar to that of the City of Oakland, encouraging private businesses and residents to keep storm drains in their neighborhood free of debris.

ECON-j-9 Encourage the formation of a community- and neighborhood-based approach to wildfire education and action through local Fire Safe Councils and the *Fire Wise Program*. This effort is important because grant funds are currently available to offset costs of specific council-supported projects.

ECON-j-10 Encourage private businesses and laboratories handling hazardous materials or pathogens increase security to a level high enough to create a deterrent to crime and terrorism, including active implementation of "cradle-to-grave" tracking systems.

ECON-j-11 Encourage joint meetings of security and operations personnel at major private employers to develop innovative ways for these personnel to work together to increase safety and security.

ECON-j-12 Inform private shoreline-property owners of the possible long-term economic threat posed by rising sea levels.

ECON-j-13 Distribute appropriate materials related to disaster mitigation and preparedness to private business owners. Appropriate materials are (1) culturally appropriate and (2) suitable for special needs populations. For example, such materials are available on the http://www.preparenow.org website and from non-governmental organizations that work with these communities on an on-going basis.

Government: Focus on Critical Facilities

GOVT-a-1 Assess the vulnerability of critical facilities (such as city halls, fire stations, operations and communications headquarters, community service centers, seaports, and airports) to damage in natural disasters and make recommendations for appropriate mitigation.

GOVT-a-2 Retrofit or replace critical facilities that are shown to be vulnerable to damage in natural

disasters.

GOVT-a-3 Clarify to workers in critical facilities and emergency personnel, as well as to elected officials and the public, the extent to which the facilities are expected to perform only at a life safety level (allowing for the safe evacuation of personnel) or are expected to remain functional following an earthquake.

GOVT-a-4 Conduct comprehensive programs to identify and mitigate problems with facility contents, architectural components, and equipment that will prevent critical buildings from being functional after major natural disasters. Such contents and equipment includes computers and servers, phones, files, and other tools used by staff to conduct daily business.

GOVT-a-5 Encourage joint meetings of security and operations personnel at critical facilities to develop innovative ways for these personnel to work together to increase safety and security.

GOVT-a-6 When installing micro and/or surveillance cameras around critical public assets tied to web-based software, and developing a surveillance protocol to monitor these cameras, investigate the possibility of using the cameras for the secondary purpose of post-disaster damage assessment.

GOVT-a-7 Identify and undertake cost-effective retrofit measures related to security on critical facilities (such as moving and redesigning air intake vents and installing blast-resistant features) when these buildings undergo major renovations related to other natural hazards.

GOVT-a-8 Coordinate with the State Division of Safety of Dams to ensure that cities and counties are aware of the timeline for the maintenance and inspection of dams whose failure would impact their jurisdiction.

GOVT-a-9 As a secondary focus, assess the vulnerability of non-critical facilities to damage in natural disasters based on occupancy and structural type, make recommendations on priorities for structural improvements or occupancy reductions, and identify potential funding mechanisms.

GOVT-a-10 Ensure that new government-owned facilities comply with and are subject to the same or more stringent regulations as imposed on privately-owned development.

GOVT-a-11 Comply with all applicable building and fire codes, as well as other regulations (such as state requirements for fault, landslide, and liquefaction investigations in particular mapped areas) when constructing or significantly remodeling government-owned facilities.

GOVT-a-12 Prior to acquisition of property to be used as a critical facility, conduct a study to ensure the absence of significant structural hazards and hazards associated with the building site.

GOVT-a-13 Ensure that any regulations imposed on private-owned businesses related to repair and reconstruction (see Economy Section) are enforced and imposed on local government's own buildings and structures.

<u>Government: Maintain and Enhance Local Government's Emergency Recovery Planning</u>

GOVT-b-1 Establish a framework and process for pre-event planning for post-event recovery that specifies roles, priorities, and responsibilities of various departments within the local government organization, and that outlines a structure and process for policy-making involving elected officials and appointed advisory committees.

GOVT-b-2 Prepare a basic Recovery Plan that outlines the major issues and tasks that are likely to be the key elements of community recovery, as well as integrate this planning into response planning (such as with continuity of operations plans).

GOVT-b-3 Establish a goal for the resumption of local government services that may vary from function to function.

GOVT-b-4 Develop a continuity of operations plan that includes back-up storage of vital records, such as plans and back-up procedures to pay employees and vendors if normal finance department operations are disrupted, as well as other essential electronic files.

GOVT-b-5 Plan for the emergency relocation of government-owned facilities critical to recovery, as well as any facilities with known structural deficiencies or in hazardous areas.

<u>Government: Maintain and Enhance Local Government's Emergency Response Capability</u>

GOVT-c-1 Develop a plan for short-term and intermediate-term sheltering of your employees.

GOVT-c-2 Encourage your employees to have a family disaster plan.

GOVT-c-3 Offer CERT/NERT-type training to your employees.

GOVT-c-4 Periodically assess the need for new or relocated fire or police stations and other emergency facilities.

GOVT-c-5 Periodically assess the need for changes in staffing levels, as well as for additional or updated supplies, equipment, technologies, and in-service training classes.

GOVT-c-6 Ensure that fire, police, and other emergency personnel have adequate radios, breathing apparatuses, protective gear, and other equipment to respond to a major disaster.

GOVT-c-7 Participate in developing and maintaining a system of interoperable communications for first responders from cities, counties, special districts, state, and federal agencies.

GOVT-c-8 Harden emergency response communications, including, for example, building redundant capacity into public safety alerting and/or answering points, replacing or hardening microwave and simulcast systems, adding digital encryption for programmable radios, and ensuring a plug-and-play capability for amateur radio.

GOVT-c-9 Purchase command vehicles for use as mobile command/EOC vehicles if current vehicles are unsuitable or inadequate.

GOVT-c-10 Maintain the local government's emergency operations center in a fully functional state of readiness.

GOVT-c-11 Expand or participate in expanding traditional disaster exercises involving city and county emergency personnel to include airport and port personnel, transit and infrastructure providers, hospitals, schools, park districts, and major employers.

GOVT-c-12 Maintain and update as necessary the local government's Standardized Emergency Management System (SEMS) Plan and the National Incident Management System (NIMS) Plan, and submit an appropriate NIMSCAST report.

GOVT-c-13 Continue to participate not only in general mutual-aid agreements, but also in agreements with adjoining jurisdictions for cooperative response to fires, floods, earthquakes, and other disasters.

GOVT-c-14 Install alert and warning systems for rapid evacuation or shelter-in-place. Such systems include outdoor sirens and/or reverse-911 calling systems.

GOVT-c-15 Conduct periodic tests of the alerting and warning system.

GOVT-c-16 Regulate and enforce the location and design of street-address numbers on buildings and minimize the naming of short streets (that are actually driveways) to single homes.

GOVT-c-17 Monitor weather during times of high fire risk using, for example, weather stations tied into police and fire dispatch centers.

GOVT-c-18 Establish regional protocols on how to respond to the NOAA Monterey weather forecasts, such as the identifying types of closures, limits on work that could cause ignitions, and prepositioning of suppression forces. A multi-agency coordination of response also helps provide unified messages to the public about how they should respond to these periods of increased fire danger. Response should also be modified based on knowledge of local micro-climates. Local agencies with less risk then may be available for mutual aid.

GOVT-c-19 Increase local patrolling during periods of high fire weather.

GOVT-c-20 Create and maintain an automated system of rain and flood gauges that is web enabled and publicly-accessible. Work toward creating a coordinated regional system.

GOVT-c-21 Place remote sensors in strategic locations for early warning of hazmat releases or use of weapons of mass destruction, understanding that the appropriate early warning strategy depends on the type of problem.

GOVT-c-22 Review and update, as necessary, procedures pursuant to the State Dam Safety Act for the emergency evacuation of areas located below major water-storage facilities.

GOVT-c-23 Improve coordination among cities, counties, and dam owners so that cities and counties can better plan for evacuation of areas that could be inundated if a dam failed, impacting their

jurisdiction.

GOVT-c-24 Develop procedures for the emergency evacuation of areas identified on tsunami evacuation maps as these maps become available.

GOVT-c-25 Support and encourage planning and identification of facilities for the coordination of distribution of water, food, blankets, and other supplies, coordinating this effort with the American Red Cross.

Government: Participate in National, State, Multi-Jurisdictional and Professional Society Efforts to Identify and Mitigate Hazards

GOVT-d-1 Promote information sharing among overlapping and neighboring local governments, including cities, counties, and special districts, as well as utilities.

GOVT-d-2 Recognize that emergency services is more than the coordination of police and fire response; it also includes planning activities with providers of water, food, energy, transportation, financial, information, and public health services.

GOVT-d-3 Recognize that a multi-agency approach is needed to mitigate flooding by having flood control districts, cities, counties, and utilities meet at least annually to jointly discuss their capital improvement programs for most effectively reducing the threat of flooding. Work toward making this process more formal to insure that flooding is considered at existing joint-agency meetings.

GOVT-d-4 As new flood-control projects are completed, request that FEMA revise its flood-insurance rate maps and digital Geographic Information System (GIS) data to reflect flood risks as accurately as possible.

GOVT-d-5 Participate in FEMA's National Flood Insurance Program.

GOVT-d-6 Participate in multi-agency efforts to mitigate fire threat, such as the Hills Emergency Forum (in the East Bay), various FireSafe Council programs, and city-utility task forces. Such participation increases a jurisdiction's competitiveness in obtaining grants.

GOVT-d-7 Work with major employers and agencies that handle hazardous materials to coordinate mitigation efforts for the possible release of these materials due to a natural disaster such as an earthquake, flood, fire, or landslide.

GOVT-d-8 Encourage staff to participate in efforts by professional organizations to mitigate earthquake and landslide disaster losses, such as the efforts of the Northern California Chapter of the Earthquake Engineering Research Institute, the East Bay-Peninsula Chapter of the International Code Council, the Structural Engineers Association of Northern California, and the American Society of Grading Officials.

GOVT-d-9 Conduct and/or promote attendance at local or regional hazard conferences and workshops for elected officials and staff to educate them on the critical need for programs in mitigating earthquake, wildfire, flood, and landslide hazards.

GOVT-d-10 Cooperate with researchers working on government-funded projects to refine information on hazards, for example, by expediting the permit and approval process for installation of seismic arrays, gravity survey instruments, borehole drilling, fault trenching, landslide mapping, flood modeling, and/or damage data collection.

Government: Take a Lead in Loss and Risk Assessment Activities

GOVT-e-1 Work with the cities, counties, and special districts in the Bay Area to encourage them to adopt a Local Hazard Mitigation Plan and to assist them in integrating it into their overall planning process. **RESPONSIBILITY**: ABAG only; all others are "not applicable."

GOVT-e-2 Improve the risk assessment and loss estimation work in the Taming Natural Disasters report and multi-jurisdictional plan related to natural disasters. **RESPONSIBILITY**: ABAG only; all others are "not applicable."

Education: Focus on Critical Facilities

EDUC-a-1 Assess the vulnerability of critical public education facilities to damage in natural disasters and make recommendations for appropriate mitigation.

EDUC-a-2 Retrofit or replace critical public education facilities that are shown to be vulnerable to

damage in natural disasters.

EDUC-a-3 Conduct comprehensive programs to identify and mitigate problems with facility contents, architectural components, and equipment that will prevent critical public education buildings from being functional after major disasters.

EDUC-a-4 As a secondary focus, assess the vulnerability of non-critical educational facilities (that is, those that do not house students) to damage in natural disasters based on occupancy and structural type, make recommendations on priorities for structural improvements or occupancy reductions, and identify potential funding mechanisms.

EDUC-a-5 Assess the vulnerability of critical private education, pre-school, and day care facilities to damage in natural disasters and make recommendations for appropriate mitigation.

EDUC-a-6 Work with CalEMA and the Division of the State Architect to ensure that there will be an adequate group of Safety Assessment Program (SAP) inspectors trained and deployed by CalEMA to schools for post-disaster inspection. In addition, if a school district is uncomfortable with delays in inspection due to too few SAP inspectors available in catastrophic disasters, formalized arrangements can also be created with those inspectors certified by the Division of the State Architect as construction inspectors to report to the district, assess damage, and determine if the buildings can be reoccupied.

Education: Use of Educational Facilities as Emergency Shelters

EDUC-b-1 Work cooperatively with the American Red Cross, cities, counties, and non-profits to set up memoranda of understanding for use of education facilities as emergency shelters following disasters.

EDUC-b-2 Work cooperatively to ensure that school district personnel and relevant staff understand and are trained that being designated by the American Red Cross or others as a potential emergency shelter does NOT mean that the school has had a hazard or structural evaluation to ensure that it can be used as a shelter following any specific disaster.

EDUC-b-3 Work cooperatively to ensure that school district personnel understand and are trained that they are designated as disaster service workers and must remain at the school until released.

Education: Actions Related to Disaster Preparedness and Recovery Planning

EDUC-c-1 Encourage employees of schools to have family disaster plans and conduct mitigation activities in their own homes.

EDUC-c-2 Develop plans, in conjunction with fire jurisdictions, for evacuation or sheltering in place of school children during periods of high fire danger, thereby recognizing that overloading of streets near schools by parents attempting to pick up their children during these periods can restrict access by fire personnel and equipment.

EDUC-c-3 Offer the 20-hour basic CERT training to teachers and after-school personnel.

EDUC-c-4 Offer the 20-hour basic Student Emergency Response Training (SERT, rather than CERT) training to middle school and/or high school students as a part of the basic science or civics curriculum, as an after school club, or as a way to earn public service hours.

EDUC-c-5 Offer the 20-hour basic CERT training course through the Adult School system and/or through the Community College system (either using instructors with teaching credentials or by making facilities available for classes not run by school personnel themselves).

EDUC-c-6 Develop and maintain the capacity for schools to take care of the students for the first 48 hours after a disaster, and notify parents that this capacity exists.

EDUC-c-7 Develop a continuity of operations and disaster recovery plan using models such as that developed by the University of California Berkeley. (The American Red Cross has a role in promoting this activity, as well, in schools that they plan to use as shelters.)

Education: Use of Schools as Conduits for Information to Families About Emergencies

EDUC-d-1 Utilize the unique ability of schools to reach families through educational materials on hazards, mitigation, and preparedness, particularly after disasters and at the beginning of the school year. These efforts will not only make the entire community more disaster-resistant,

but speed the return of schools from use as shelters to use as teaching facilities, particularly if coordinated with cities, counties, the American Red Cross and others.

EDUC-d-2 Develop and distribute culturally appropriate materials related to disaster mitigation and preparedness, such as those on the http://www.preparenow.org website.

Environment: Environmental Sustainability and Pollution Reduction

ENVI-a-1 Continue to enforce State-mandated requirements, such as the *California Environmental Quality Act*, to ensure that mitigation activities for hazards, such as seismic retrofits and vegetation clearance programs for fire threat, are conducted in a way that reduces environmental degradation such as air quality impacts, noise during construction, and loss of sensitive habitats and species, while respecting the community value of historic preservation.

ENVI-a-2 Encourage regulatory agencies to work collaboratively with safety professionals to develop creative mitigation strategies that effectively balance environmental and safety needs, particularly to meet critical wildfire, flood, and earthquake safety levels.

ENVI-a-3 Continue to enforce and/or comply with State-mandated requirements, such as the *California Environmental Quality Act* and environmental regulations to ensure that urban development is conducted in a way to minimize air pollution. For example, air pollution levels can lead to global warming, and then to drought, increased vegetation susceptibility to disease (such as pine bark beetle infestations), and associated increased fire hazard.

ENVI-a-4 Develop and implement a comprehensive program for watershed management optimizing ecosystem health with water yield to balance water supply, flooding, fire, and erosion concerns.

ENVI-a-5 Balance the need for the smooth flow of storm waters versus the need to maintain wildlife habitat by developing and implementing a comprehensive Streambed Vegetation Management Plan that ensures the efficacy of flood control efforts, mitigates wildfires and maintains the viability of living rivers.

ENVI-a-6 Comply with applicable performance standards of any *National Pollutant Discharge Elimination System* municipal stormwater permit that seeks to manage increases in stormwater run-off flows from new development and redevelopment construction projects.

ENVI-a-7 Enforce and/or comply with the grading, erosion, and sedimentation requirements by prohibiting the discharge of concentrated stormwater flows by other than approved methods that seek to minimize associated pollution.

ENVI-a-8 Explore ways to require that hazardous materials stored in the flood zone be elevated or otherwise protected from flood waters.

ENVI-a-9 Enforce and/or comply with the hazardous materials requirements of the State of California Certified Unified Program Agency (CUPA).

ENVI-a-10 Provide information on hazardous waste disposal and/or drop off locations.

ENVI-a-11 When remodeling existing government and infrastructure buildings and facilities, remove asbestos to speed up clean up of buildings so that they can be reoccupied more quickly.

ENVI-a-12 Develop and implement a program to control invasive and exotic species that contribute to fire and flooding hazards (such as eucalyptus, cattails, and cordgrass). This program could include vegetation removal, thinning, or replacement in hazard areas where there is a direct threat to structures.

ENVI-a-13 Enforce provisions under creek protection, stormwater management, and discharge control ordinances designed to keep watercourses free of obstructions and to protect drainage facilities to conform with the Regional Water Quality Control Board's Best Management Practices.

Environment: Climate Change

ENVI-b-1 Stay informed of scientific information compiled by regional and state sources on the subject of rising sea levels and global warming, especially on additional actions that local governments can take to mitigate this hazard including special design and engineering of government-owned facilities in low-lying areas, such as wastewater treatment plants, ports,

and airports.

ENVI-b-2 Inventory global warming emissions in your own local government's operations and in the community, set reduction targets and create an action plan.

ENVI-b-3 Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities.

ENVI-b-4 Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit.

ENVI-b-5 Increase the use of clean, alternative energy by, for example, investing in “green tags”, advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology.

ENVI-b-6 Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money.

ENVI-b-7 Purchase only Energy Star equipment and appliances for local government use.

ENVI-b-8 Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system.

ENVI-b-9 Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel.

ENVI-b-10 Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production.

ENVI-b-11 Increase recycling rates in local government operations and in the community.

ENVI-b-12 Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO2.

ENVI-b-13 Help educate the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution.

<u>Environment: Agricultural and Aquaculture Resilience</u>

ENVI-c-1 Maintain a variety of crops in rural areas of the region to increase agricultural diversity and crop resiliency. RESPONSIBLE AGENCIES: County Offices of the Agricultural Commissioner.

ENVI-c-2 Promote and maintain the public-private partnerships dedicated to preventing the introduction of agricultural pests into regionally-significant crops, such as the glassy-winged sharpshooter into vineyards. RESPONSIBLE AGENCIES: County Offices of the Agricultural Commissioner.

ENVI-c-3 Encourage livestock operators to develop an early-warning system to detect animals with communicable diseases (due to natural causes or bioterrorism). RESPONSIBLE AGENCIES: County Health Department and Office of the County Agricultural Commissioner.

<u>Land Use: Earthquake Hazard Studies for New Private Developments</u>

LAND-a-1 Enforce and/or comply with the State-mandated requirement that site-specific geologic reports be prepared for development proposals within Alquist-Priolo Earthquake Fault Zones, and restrict the placement of structures for human occupancy. (This Act is intended to deal with the **specific** hazard of active faults that extend to the earth’s surface, creating a surface rupture hazard.)

LAND-a-2 Require preparation of site-specific geologic or geotechnical reports for development and redevelopment proposals in areas subject to earthquake-induced landslides or liquefaction as mandated by the State Seismic Hazard Mapping Act in selected portions of the Bay Area where these maps have been completed, and condition project approval on the incorporation of necessary mitigation measures related to site remediation, structure and foundation design, and/or avoidance.

LAND-a-3 Recognizing that some faults may be a hazard for surface rupture, even though they do not

meet the strict criteria imposed by the Alquist-Priolo Earthquake Fault Zoning Act, identify and require geologic reports in areas adjacent to locally-significant faults.

LAND-a-4 Ensure that development proposed near faults with a history of complex surface rupture (multiple traces, warping, thrusting, etc.) has larger setbacks than the minimum fifty feet.

LAND-a-5 Consider imposing requirements similar to the Alquist-Priolo Earthquake Fault Zoning Act for structures without human occupancy if these buildings are still essential for the economic recovery of the community or region.

LAND-a-6 Recognizing that the California Geological Survey has not completed earthquake-induced landslide and liquefaction mapping for much of the Bay Area, identify and require geologic reports in areas mapped by others as having significant liquefaction or landslide hazards.

LAND-a-7 Support and/or facilitate efforts by the California Geological Survey to complete the earthquake-induced landslide and liquefaction mapping for the Bay Area.

LAND-a-8 Require that local government reviews of geologic and engineering studies are conducted by appropriately trained and credentialed personnel.

<u>Land Use: Wildfire and Structural Fires</u>

LAND-b-1 Review new development proposals to ensure that they incorporate required and appropriate fire-mitigation measures, including adequate provisions for occupant evacuation and access by emergency response personnel and equipment.

LAND-b-2 Develop a clear legislative and regulatory framework at both the state and local levels to manage the wildland-urban-interface consistent with Fire Wise and sustainable community principles.

<u>Land Use: Flooding</u>

LAND-c-1 Establish and enforce requirements for new development so that site-specific designs and source-control techniques are used to manage peak stormwater runoff flows and impacts from increased runoff volumes.

LAND-c-2 Incorporate FEMA guidelines and suggested activities into local government plans and procedures for managing flood hazards.

LAND-c-3 Provide an institutional mechanism to ensure that development proposals adjacent to floodways and in floodplains are referred to flood control districts and wastewater agencies for review and comment (consistent with the NPDES program).

LAND-c-4 Establish and enforce regulations concerning new construction (and major improvements to existing structures) within flood zones in order to be in compliance with federal requirements and, thus, be a participant in the Community Rating System of the *National Flood Insurance Program*.

LAND-c-5 Encourage new development near floodways to incorporate a buffer zone or setback from that floodway to allow for changes in stormwater flows in the watershed over time.

LAND-c-6 For purposes of creating an improved hazard mitigation plan for the region as a whole, ABAG, and Bay Area cities and counties, jointly request geographically defined repetitive flooding loss data from FEMA for their own jurisdictions.

<u>Land Use: Landslides and Erosion</u>

LAND-d-1 Establish and enforce provisions (under subdivision ordinances or other means) that geotechnical and soil-hazard investigations be conducted and filed to prevent grading from creating unstable slopes, and that any necessary corrective actions be taken prior to development approval.

LAND-d-2 Require that local government reviews of these investigations are conducted by appropriately trained and credentialed personnel.

LAND-d-3 Establish and enforce grading, erosion, and sedimentation ordinances by requiring, under certain conditions, grading permits and plans to control erosion and sedimentation prior to development approval.

LAND-d-4 Establish and enforce provisions under the creek protection, storm water management, and

discharge control ordinances designed to control erosion and sedimentation.

LAND-d-5 Establish requirements in zoning ordinances to address hillside development constraints, especially in areas of existing landslides.

Land Use: Hillsides - Multi-hazard

LAND-e-1 For new development, require a buffer zone between residential properties and landslide or wildfire hazard areas.

LAND-e-2 Discourage, add additional mitigation strategies, or prevent new construction or major remodels on slopes greater than a set percentage, such as 15%, due to landslide or wildfire hazard concerns.

Land Use: Smart Growth to Revitalize Urban Areas and Promote Sustainability

LAND-f-1 Prioritize retrofit of infrastructure that serves urban areas (or urban services areas) over constructing new infrastructure to serve outlying areas.

LAND-f-2 Work to retrofit homes in older urban neighborhoods to provide safe housing close to job centers.

LAND-f-3 Work to retrofit older downtown areas and redevelopment districts to protect architectural diversity and promote disaster-resistance.

LAND-f-4 Work with non-profits and through other mechanisms to protect as open space those areas susceptible to extreme hazards (such as through land acquisition, zoning, and designation as priority conservation areas).

LAND-f-5 Strive to provide and preserve existing buffers between development and existing users of large amounts of hazardous materials, such as major industry, due to the potential for catastrophic releases or fires due to an earthquake, accident, or terrorism. (Flooding might also result in release or spread of these materials; however, it is unlikely.) In areas where buffers do not exist or cannot be created, provide alternative mitigation.

Land Use: Hazard Abatement Districts

LAND-g-1 Use hazard abatement districts as a funding mechanism to ensure that mitigation strategies are implemented and enforced over time.

Source: Association of Bay Area Governments, 2009-2010.

The following pages list the disaster preparedness plans used by various Alameda County agencies and departments.

Alameda County Disaster Preparedness *DRAFT*

Emergency Operation Plans

- Animal Shelter Plan (OES)
- Medically Fragile Shelter Plan (PHD)
- Mass Casualty Plan (PHD)
- SNS Mass Prophylaxis Plan (PHD)
- Pandemic Flu Plan (PHD)
- Patient Evacuation Plan (PHD)
- Alternate Site Care Plan (PHD)
- Emergency Child Care Plan (GSA)
- Boundary Zone Protection Plan (OES)
- Other TBD
- Other TBD
- Other TBD

- Emergency Public Information Plan (CAO/ACSO)
- Debris Management Plan (PWA)
- GSA Comm. Plan (GSA)
- Post Disaster Recovery Plan (GSA)
- Emergency Operations Plan (FZ 7)
- Bldg Occupancy Resumption Plan (GSA)
- Potable Water Plan (GSA)
- Emergency Safety Procedures (DEH)
- Donations Management Plan (ACSO)
- Mass Fatality Plan (ACSO Coroner)
- Other TBD
- Other TBD

- COOP/COG Plans (All Depts.)
- Records Emer. Action Plan (TBD)
- Evacuation Plan (OES)
- Emergency Comm. Plan (OES)
- Genset Refueling Plan (GSA)
- Illness & Injury Prevention Plan (All Depts.)
- Mass Care and Shelter Plan (SSA)
- Disaster Service Worker Plan (HRS)
- Volunteer Management Plan (GSA)
- Emergency Safety Procedures (DEH)
- Hazardous Materials Plan (GSA/ACFD)
- Other TBD
- Other TBD

Emergency Preparedness Plans

- Epidemiology and Surveillance (PHD)
- Mass Chemoprophylaxis (PHD)
- Casualty Management (PHD)
- Quarantine & Isolation (PHD)
- Evacuation-Shelter-in-Place (PHD)
- Risk Communications (PHD)
- Laboratory (PHD)
- Hospital/HU Provider Status Reporting (PHD)
- Personal Protective Equipment (PHD)
- Pub. Health Emer. Preparedness Plan PHD
- 2007-2012 Mitigation Plan (GSA-ABAG)
- Equip. & Supplies Pre-positioning (GSA/PWA)

- Biological Agent Health Affects & Decontamination (PHD)
- Nuclear & Chem. Health Effects & Decontamination (PHD)
- Strategic National Stockpile Distribution Plan (PHD)
- City Readiness Plan (Bioterror) (PHD)
- Communications Info. Technology (PHD)
- Morgue (PHD)
- Security (PHD)
- Smallpox (PHD)
- Influenza Pandemic Response Plan (PHD)
- Mental Health (PHD)
- 2010-2015 Mitigation Plan (GSA-ABAG)
- Non-Structural Mitigation Plan (GSA)

County Codes, Ordinances and Initiatives

- Waste Mgt & Green Bldg Ordinance (GSA/CC)
- Ordinance 0-2001-54 (CC)
- County Capital Improvement Plan (CAO/GSA/PWA)
- Community Climate Action Plan (GSA)
- Alameda County Climate Action Plan (GSA)
- Order of Succession (CC)
- Other TBD

- Alameda County Grading Ordinance (PWA)
- Enter. Protocols And Procedures (CC)
- General Plan and Safety Element (CDA)
- Authority of PH Official to Declare Emergency (PHD)
- Alameda County Strategic Vision (CAO/BOS)
- Other TBD
- Other TBD

Outreach and Education

- Medical Reserve Corps (Fremont-Oakland)
- Emergency Volunteer Centers (TBD)
- Pandemic Flu Pocket Guide (PHD)
- WHACK the Flu Program (PHD)
- SKIP (Safety Kept in Place) Kits (PHD)
- Other TBD
- Other TBD

- Disaster Resistant Jobs (Econ. Dev)
- CERT Training (ACFD)
- Business Continuity Planning (TBD)
- Res. Preparedness and Recovery (TBD)
- Pocket Emergency Guides (PHD)
- Other TBD
- Other TBD

County MOUs & Contracts

- Red Cross (SSA)
- USCG (OES)
- Salvation Army Mass Care (OES)
- AC Transit (OES)
- Paratransit (OES)
- Long Term Care Facilities Mutual Aid (PHD/ACMC)
- Hospitals & PH Mutual Aid (PHD)
- Pediatric Regional Coalition (PHD)
- Community-Based Organizations (PHD)
- PG&E (OES)
- Other TBD
- Other TBD

- USACE (OES)
- National Guard (OES)
- Port Authority City of Oakland (OES)
- EBMUD (OES)
- County Office of Education (OES)
- Disaster & Debris Mgt. Contracts (GSA)
- Mutual Aid (Alameda County)
- Mutual Aid (State)
- CARD (PHD)
- Records Restoration TBD
- Other TBD
- Other TBD

County Tools

- Emergency Notification System (OES)
- EMS Software (OES)
- Hosp. Surveillance System (PHD)
- Medical Health & Operational Manual (PHD)
- Redinet (PHD)
- California Health Alert Network (PHD)
- Inventory Mgt. System (PHD)
- Call Center (PHD)
- Right Fax (PHD)
- Other TBD
- Other TBD
- Other TBD

- GIS Mapping (ITD)
- Data Archive (ITD)
- Drills - Testing, Traning, Evaluation (OES)
- Drills – Testing, Traning, Evaluation (PHD)
- Patient Tracking System (PHD)
- Patient Transport Tag (PHD/ACMC)
- Alert Messaging (PHD)
- Alternate Messaging (PHD)
- Training Videos (PHD)
- Other TBD
- Other TBD
- Other TBD

ABBREVIATIONS:

ABAG	Association of Bay Area Governments
ACFD	Alameda County Fire Department
ACMC	Alameda County Medical Center
ACSO	Alameda County Sheriff's Office
BOS	Board of Supervisors
CC	County Counsel
CAO	County Administrator's Office
CARD	Collaborating Agcy Resp. to Disasters
CDA	Community Development Agency
CERT	Citizen Emergency Response Team
DEH	Department of Environmental Health
EBMUD	East Bay Municipal Utilities District
FZ7	Flood Zone 7
GSA	General Services Agency
HRS	Human Resource Services
ITD	Information Technology Department
MOU	Memoranda of Understanding
OES	Office of Emergency Services (ACSO)
PG&E	Pacific Gas & Electric
PHD	Public Health Department
PWA	Public Works Agency
SSA	Social Services Agency
TBD	To Be Determined
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard

LEGEND:

- New Completed Plan (requires periodic updates)
- In Progress (new or being updated)
- Not Started
- Existing Program (requires periodic updates)
- Status unknown or newly defined plan
- County General Funds — GF
- FEMA/CA State Grant Award — GA

Facility Name	Facility Address
Police Services	
Administration Office	1401 Lakeside Drive, 12th Floor, Oakland, CA 94612-4305
Airport Police Services	8980 Earhart Road, Oakland, CA 94621
A. C. Transit	2425 East 12th Street, Oakland, CA 94601
Backgrounds/Recruiting	6289 Madigan Road, Dublin, CA 94568
Civil/Bailiff Section	1225 Fallon Street, Room 104, Oakland, CA 94612
Contract Law Enforcement Services	2425 East 12th Street, Oakland, CA 94601
Coroner's Bureau	480 4th Street, Oakland, CA 94601
Criminalistics Laboratory	15001 Foothill Boulevard, San Leandro, CA 94578-1092
Departmental Watch Commanders	2000 150th Avenue, San Leandro, CA 94578
Dublin Police Services	100 Civic Plaza, Dublin, CA 94568-3100
East County Animal Shelter	4595 Gleason Drive, Dublin, CA 94568
Eden Township Substation	15001 Foothill Boulevard, San Leandro, CA 94578-1092
Emergency Services Dispatch	2000 150th Avenue, San Leandro, CA 94578
Field And Reserve Unit	4985 Broder Boulevard, Dublin, CA 94568
Human Resources	1401 Lakeside Drive, 12th Floor, Oakland, CA 94612
Internal Affairs	1401 Lakeside Drive, 7th Floor, Oakland, CA 94612
John George Psychiatric Pavillion Deputies Office	2060 Fairmont Drive, San Leandro, CA 94537
Management Services Division	1401 Lakeside Drive, 12th Floor, Oakland, CA 94612
Marine Patrol Unit	8980 Earhart Road, Oakland, CA 94603
Marshal, North County	661 Washington Street, Oakland, CA 94607
Marshal, South County	24405 Amador Street, Hayward, CA 94544
Fremont/Newark/Union City	39439 Paseo Padre Parkway, Fremont, CA 94538
Livermore/Pleasanton	5672 Stoneridge Drive, Pleasanton, CA 94588
Medical Center Police Services	1411 East 31st Street, Oakland, CA 94602
Office Of Homeland Security & Emergency Services	4985 Broder Boulevard, Dublin, CA 94568
Peralta Police Services	333 East 8th Street, Oakland, CA 94606
Planning & Research	1401 Lakeside Drive, 7th Floor, Oakland, CA 94612
Regional Training Center	6289 Madigan Road, Dublin, CA 94568
Social Service Agency Police Services	7751 Edgewater Drive, Oakland, CA 94621

Facility Name	Facility Address
Detention Facilities	
Glenn Dyer Detention Facility	550 6th Street, Oakland, CA 94607
Santa Rita Jail	5325 Broder Boulevard, Dublin, CA 94568
Juvenile Hall	2500 Fairmont Srive, San Leandro, CA 94578
Fire Protection Services	
Administration Office / Fire Prevention Bureau	835 East 14th Street, San Leandro, CA 94577
Fire Prevention Bureau - Unincorporated	399 Elmhurst Street, Hayward, CA 94544
Fire Prevention Bureau - Dublin	100 Civic Plaza, Dublin, CA
Training Facility	890 Lola Street, San Leandro, CA
Emergency Medical Services/Training Division	1426 164th Avenue, San Leandro, CA
Alameda County Regional Emergency Communication Center	Lawrence Livermore National Laboratory, Livermore, CA
Newark Fire Prevention	37101 Newark Boulevard, Newark, CA 94560
Union City Fire Prevention	34009 Alvarado-Niles Road, Union City, CA 94587
ACFD Station #6	19780 Cull Canyon Road, Castro Valley, CA 94552
ACFD Station #7	6901 Villareal Avenue, Castro Valley, CA 94552
ACFD Station #8	1617 College Avenue, Livermore, CA 94550
ACFD Station #9	450 Estudillo Avenue, San Leandro, CA 94577
ACFD Station #10	2194 Williams Street, San Leandro, CA 94577
ACFD Station #11	14903 Catalina Street, San Leandro, CA 94577
ACFD Station #12	1065 143rd Avenue, San Leandro, CA 94577
ACFD Station #13	637 Fargo Avenue, San Leandro, CA 94577
ACFD Station #14	11345 Pleasanton-Sunol Road, Sunol, CA 94586
ACFD Station #15	5325 Broder Road, Dublin, CA 94586
ACFD Station #16	7494 Donohue Drive, Dublin, CA 94586
ACFD Station #17	6200 Madigan, Dublin, CA 94586
ACFD Station #18	4800 Fallon Rd., Dublin, CA 94586
ACFD Station #19	1 Cyclotron Road, Berkeley, CA 94720
ACFD Station #20	7000 East Avenue, Livemore, CA
ACFD Station #21	15999 W. Corral Hollow Road, Tracy, CA 95377

Facility Name	Facility Address
ACFD Station #22	427 Paseo Grande, San Lorenzo, CA 94580
ACFD Station #23	109 Grove Way, Hayward, CA 94541
ACFD Station #24	1430 164th Avenue, San Leandro, CA 94578
ACFD Station #25	20336 San Miguel Avenue, Castro Valley, CA 94546
ACFD Station #26	18770 Lake Chabot Road, Castro Valley, CA 94546
ACFD Station #27	39039 Cherry Street, Newark, CA 94560
ACFD Station #28	7550 Thornton Avenue, Newark, CA 94560
ACFD Station #29	35775 Ruschin Drive, Newark, CA 94560
ACFD Station #30	35000 Eastin Court, Union City, CA 94587
ACFD Station #31	33555 Central Avenue, Union City, CA 94587
ACFD Station #32	31600 Alvarado Blvd, Union City, CA 94587
ACFD Station #33	33942 7th Street, Union City, CA 94587
Fire Station # 1	22700 Main Street, Hayward, CA 94541
Fire Station # 6	1401 West Winton Avenue, Hayward, CA 94545
Fire Station # 2	360 West Harder Road, Hayward, CA 94544
Fire Station # 7	28270 Huntwood Avenue, Hayward, CA 94544
Fire Station # 3	31982 Medinah Street, Hayward, CA 94552
Fire Station # 8	25862 Five Canyons Parkway, Hayward, CA 94552
Fire Station # 4	27836 Loyola Avenue , Hayward, CA 94545
Fire Station # 9	24912 Second Street, Hayward, CA 94541
Fire Station # 5	28595 Hayward Boulevard, Hayward, CA 94542
Cal Fire SCU Sunol	11345 Pleasanton-Sunol Rd., Pleasanton, CA 94566
Canyon Middle	19600 Cull Canyon Rd.
Schools	
Castro Valley Elementary	20185 San Miguel Ave. , Castro Valley, CA 94552
Castro Valley High	19400 Santa Maria Ave., Castro Valley, CA 94546
Chabot Elementary	19104 Lake Chabot Rd., Castro Valley, CA 94546
Creekside Middle	19722 Center St., Castro Valley, CA 94546
Independent Elementary	21201 Independent School Rd., Castro Valley, CA 94546
Jensen Ranch Elementary	20001 Carson Ln., Castro Valley, CA 94552

Facility Name	Facility Address
Marshall Elementary	20111 Marshall St., Castro Valley, CA 94552
Palomares Elementary	6395 Palo Verde Rd., Castro Valley, CA 94546
Proctor Elementary	17520 Redwood Rd., Castro Valley, CA 94552
Redwood Alternative High	18400 Clifton Way, Castro Valley, CA 94546
Redwood Continuation High	18400 Clifton Way, Castro Valley, CA 94546
Stanton Elementary	2644 Somerset Ave., Castro Valley, CA 94546
Vannoy Elementary	5100 Vannoy, Castro Valley, CA 94546
Arroyo High	15701 Lorenzo Ave., San Lorenzo, CA 94580
Bay Elementary	2001 Bockman Rd., San Lorenzo, CA 94580
Bohannon Middle	800 Bockman Rd., San Lorenzo, CA 94580
Cherryland Elementary	585 Willow Ave., Hayward, CA 94541
East Avenue Elementary	2424 East Ave., Hayward, CA 94541
Eden Gardens Elementary	2184 Thayer Ave., Hayward, CA 94545
Fairview Elementary	23515 Maud Ave., Hayward, CA 94541
Sunol Glen Elementary	11601 Main St., Sunol, CA 94586
Hospitals	
Eden Medical Center	20103 Lake Chabot Road, Castro Valley, CA 94546
Fairmount Hospital	15400 Foothill Boulevard, San Leandro, CA 94578
John George Psychiatric Pavilion	2060 Fairmont Drive, San Lorenzo, CA 94578

List of Acronyms

Abbreviation	Description
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AC	Advisory Circular
ACA	American Correctional Association
ACDEH	Alameda County Department of Environmental Health
ACFCWCD	Alameda County Flood Control and Water Conservation District
ACFD	Alameda County Fire Department
ACRECC	Alameda County Regional Emergency Communications Center
AIA	Airport Influence Area
ALUC	Airport Land Use Commission
BOS	Board of Supervisors
CADWR	California Department of Water Resources
CALEA	Commission on Accreditation for Law Enforcement Agencies
CBC	California Building Code
CDF	California Department of Forestry
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Team
CFR	Code of Federal Regulations
CGS	California Geological Survey
CUPA	Certified Unified Program Agency
DOSD	Department of Water Resources, Division of Safety of Dams
DTSC	State of California Department of Toxics Substances Control
EBMUD	East Bay Municipal Utility District
ECAP	East County Area Plan
EOC	Emergency Operations Center
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
HMBP	Hazardous Materials Business Plan
ISO	Insurance Safety Organization
LHMP	Local Hazard Mitigation Plan
MM	Modified Mercalli
MYP	Map Your Neighborhood
NFIP	National Flood Insurance Program
NPDES	National Pollutant Discharge Elimination System
OAERP	Operational Area Emergency Response Plan
OES	Governor's Office of Emergency Services
PEP	Personal Emergency Preparedness
RMP	Risk Management Plan
SEMS	Standard Emergency Management System
SHMA	Seismic Hazards Mapping Act
SOSHES	Sheriff's Office of Homeland Security and Emergency Services
SPCC	Spill Prevention Control and Countermeasure
USGS	U.S. Geological Survey
UST	Underground Storage Tank
Zone 7	Zone 7 Water Agency
DMA 2000	federal Disaster Mitigation Act of 2000