

8 PUBLIC SAFETY ELEMENT

As required by State law, the Public Safety Element addresses the protection of the community from unreasonable risks from natural and manmade hazards. This Element provides information about risks in the Eden Area and delineates policies designed to prepare and protect the community as much as possible from the effects of:

- ◆ Geologic hazards, including earthquakes, ground-shaking, liquefaction and landslides.
- ◆ Flooding, including dam failures and inundation, tsunamis and seiches.
- ◆ Wildland fires.
- ◆ Hazardous materials.

This Element also contains information and policies regarding general emergency preparedness. Each section includes background information on the particular hazard followed by goals, policies and actions designed to minimize risk for Eden Area residents.

The Public Safety Element establishes mechanisms to prepare for and reduce death, injuries and damage to property from public safety hazards like flooding, fires and seismic events. Hazards are an unavoidable aspect of life, and the Public Safety Element cannot eliminate risk completely. Instead, the Element contains policies to create an acceptable level of risk.

1. GEOLOGY AND SEISMIC HAZARDS

Earthquakes and secondary seismic hazards such as ground-shaking, liquefaction and landslides are the primary geologic hazards in the Eden Area. This section provides background on the seismic hazards that affect the Eden Area and includes goals, policies and actions to minimize these risks.

A. Background Information

As is the case in most of California, the Eden Area is subject to risks from seismic activity. The Eden Area is located in the San Andreas Fault Zone, one of the most seismically-active regions in the United States, which has generated numerous moderate to strong earthquakes in northern California and in the San Francisco Bay Area. The region experienced large and destructive earthquakes in 1838, 1868, 1906 and 1989. Future earthquakes of equally grave proportions are a certainty in the San Francisco Bay region according to the Working Group on California Earthquake Probabilities (WG 02), established by the U.S. Geological Survey (USGS).¹

Earthquakes can also give rise to various secondary seismic hazards, including ground shaking, liquefaction and subsidence, ground rupture and slope instability. These seismic hazards can cause damage to structures, and risk the health and safety of citizens, particularly in unreinforced masonry buildings.

1. Measuring Earthquake Magnitudes

The strength of an earthquake is generally expressed in two ways: *magnitude* and *intensity*. Magnitude, which is expressed in whole numbers and decimals (e.g. 7.1), is a measure that depends on the seismic energy radiated by the earthquake as recorded on seismographs. The original magnitude scale is the Richter scale (M),² which has no upper limit and is not used to express damage.³ Earthquakes with magnitude of about 2.0M or less on the Richter scale are usually called microearthquakes and are not commonly felt by people. Events with magnitudes of about 4.0M and up are felt by most people.

¹U.S. Geological Survey, 2003, *Earthquake Probabilities In the San Francisco Bay Region: 2003-2032* by the Working Group on California Earthquake Probabilities. Open-File Report 03-214, page 1.

² California Geological Survey, *How Earthquakes and Their Effects are Measured*, Note 32, Revised April 2002.

³ USGS Earthquake Hazards Program (<http://neic.usgs.gov/neis/general/richter.html>, accessed on January 27, 2005).

The most commonly used magnitude scale today is the Moment Magnitude (Mw) scale, which is related to the physical size of fault rupture and the movement across a fault. Mw is based on the seismic moment⁴ at the source, or epicenter, of the earthquake. The Moment Magnitude scale is a way of rating the seismic moment of an earthquake with a simple, logarithmic numerical scale similar to the original Richter magnitude scale. Because it does not “saturate” the way local magnitude does, it is used for large earthquakes—those that would have a local magnitude of about 6.0M or larger.⁵

The force of an earthquake at a particular place is measured on the Modified Mercalli Intensity Scale, which is a subjective ranking of an earthquake’s effects on persons and structures. It is expressed in Roman numerals from I to XII. Lower numbers on the scale indicate less severe shaking. Table 8-1 summarizes the Modified Mercalli Intensity Scale in relation to the Richter Scale.

2. Earthquake Faults

The Hayward Fault, one of ten major faults that comprise the San Andreas Fault Zone, runs along the eastern edge of the Eden Area and links with the Rodgers Creek Fault to the north. Although the last major earthquake generated by the Hayward Fault was in 1868, pressure is slowly building again and will begin to overcome the friction and other forces that are causing the fault zone to stick. Eventually, the accumulated energy will be released in another big earthquake.⁶

⁴ The seismic moment of an earthquake is determined by the strength or resistance of rocks to faulting multiplied by the area of the fault that ruptures and by the average displacement that occurs across the fault during the earthquake. (Source: California Geological Survey, *How Earthquakes and Their Effects are Measured*, Note 32, Revised April 2002.)

⁵ Sources: California Geological Survey, *How Earthquakes and Their Effects are Measured*, Note 32, Revised April 2002; <http://www.seismo.berkeley.edu/seismo/faq/magnitude.html>; <http://www.scecdc.scec.org/Module/sec3pg19.html>.

⁶ U.S. Geological Survey, *USGS Open House 2000 Field Trip – Hayward fault zone, Hayward.*, <http://wrgis.wr.usgs.gov/wgmt/sfbay/oh2000-ha-ft.pdf>.

TABLE 8-1 **MODIFIED MERCALLI AND RICHTER SCALES**

Definition for this Plan	Richter Magnitude	Modified Mercalli Category	Expected Modified Mercalli Maximum Intensity at Epicenter
Minor	2	I-II	Usually detected only by instruments
	3	III	Felt indoors
	4	IV-V	Felt by most people; slight damage
Moderate	5	VI-VII	Felt by all; many frightened and run outdoors; minor to moderate damage
Major	6	VII-VIII	Everybody runs outdoors moderate to major damage
	7	IX-X	Major damage
	8+	X-XII	Total and major damages

Source: ABAG (<http://www.abag.ca.gov/bayarea/eqmaps/doc/mmi.html>).

According to WG 02, the fault system that includes the Hayward and Rodgers Creek faults has a 27 percent probability of generating an earthquake with a magnitude greater than or equal to 6.7 on the Mercalli Richter Scale in the next 30 years. It is also the most likely fault in the Bay Area to be the site of a major earthquake in this time period.⁷

The Hayward Fault is of particular concern to WG 02 because of the dense urban fabric of the communities adjacent to it, and the major infrastructure lines that cross it. A large earthquake on the Hayward Fault would, in all probability, cause extensive damage throughout the Eden Area.

⁷ U.S. Geological Survey, *USGS Open House 2000 Field Trip – Hayward fault zone, Hayward.*, <http://wrgis.wr.usgs.gov/wgmt/sfbay/oh2000-ha-ft.pdf>, page 4.

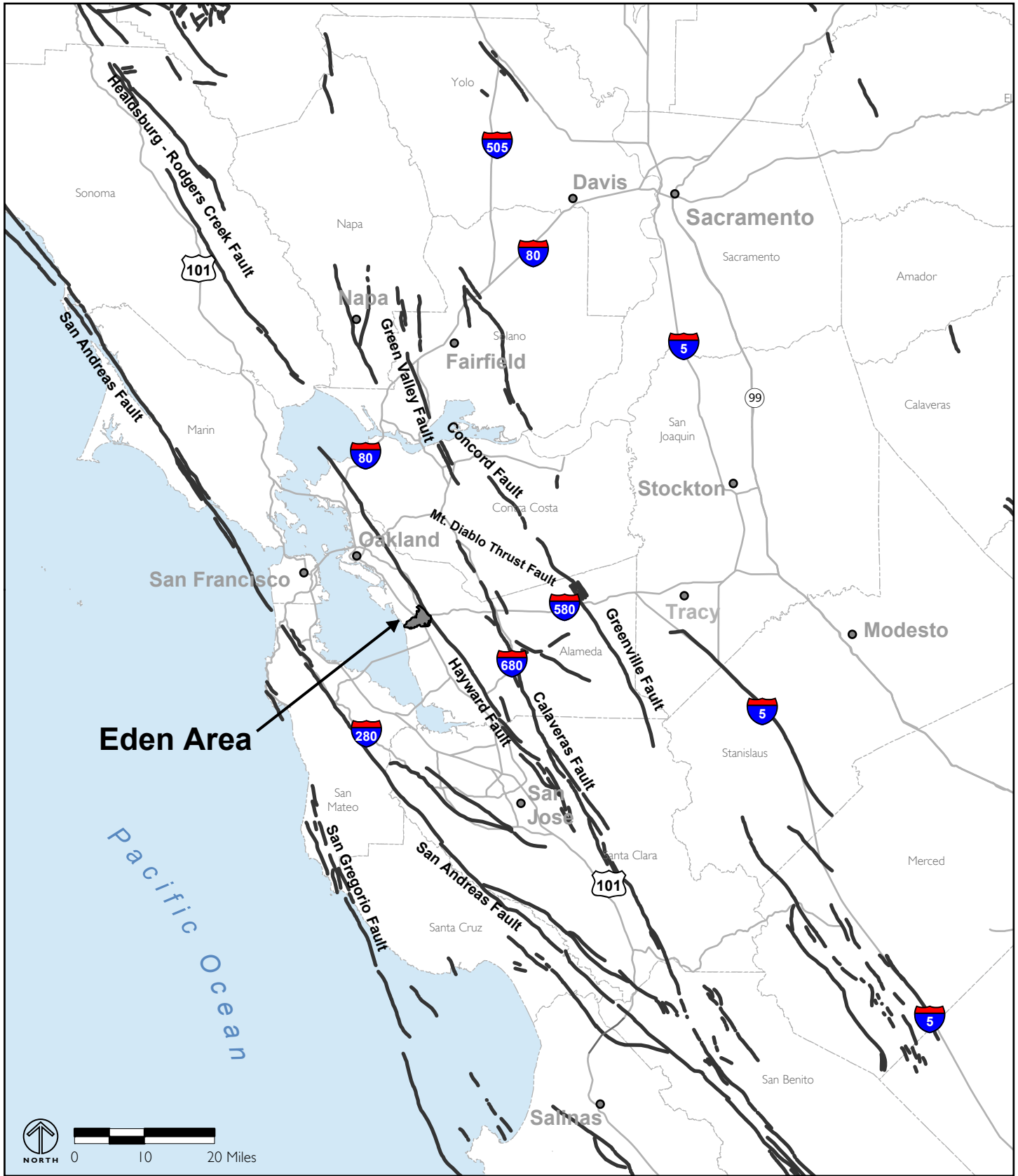
A moderate to major earthquake along the Hayward Fault is most likely to generate the strongest ground shaking in the area, but other regional faults, including the San Andreas, Calaveras, Rodgers Creek and others could also affect the Eden Area. Regional faults are shown in Figure 8-1. A moderate to major earthquake on any of these faults could topple buildings, disrupt infrastructure, cripple the transportation system and trigger landslides.

3. Secondary Earthquake Hazards

Earthquakes often result in secondary hazards that may cause widespread damage. The three most likely secondary earthquake hazards in the Eden Area are ground-shaking, liquefaction and landslides. The USGS and the Association of Bay Area Governments (ABAG) have worked together to map the likely intensity of ground-shaking throughout the Bay Area under various earthquake scenarios. The most intense ground-shaking scenario mapped in the Eden Area assumes a 6.9 magnitude earthquake on the Hayward Fault system. The predicted ground-shaking from such an earthquake would be “very violent” or “violent” throughout most of the Eden Area.⁸

The California Geological Survey has mapped liquefaction and landslide hazards. Liquefaction occurs when the strength of saturated, loose, granular materials, such as silt, sand or gravel, is dramatically reduced as a result of an earthquake. This earthquake-induced deformation transforms a stable material into a temporary fluid-like state in which solid particles are virtually in

⁸ Association of Bay Area Government’s Earthquake Maps and Information website. <http://www.abag.ca.gov/bayarea/eqmaps>. Violent shaking (IX Mw) would produce heavy damage and general panic. Some masonry and frame buildings would face serious structural and foundation damage. Reservoirs and underground pipes would also be at serious risk. Conspicuous cracks and ground disruption particularly in alluvial areas, are anticipated. Very Violent shaking (X Mw) would result in extreme damage. Most masonry and frame structures would be destroyed with their foundations. Some well-built wooden structures and bridges destroyed. There could be serious damage to dams, dikes, embankments and large landslides. Water may also be thrown from waterbodies and sand and mud would shifted horizontally on beaches and flat land. Rails would be bent slightly by the motion.



Source: Deisgn, Community & Environment, May, 2004; US Geologic Survey, Working Group on California Earthquake Probabilities, 1990; Stellar Environmental Solutions, November 1996. Faults were screen-digitized by DC&E and are intended for illustrative purposes only; locations are approximate.

FIGURE 8-1

REGIONAL FAULTS

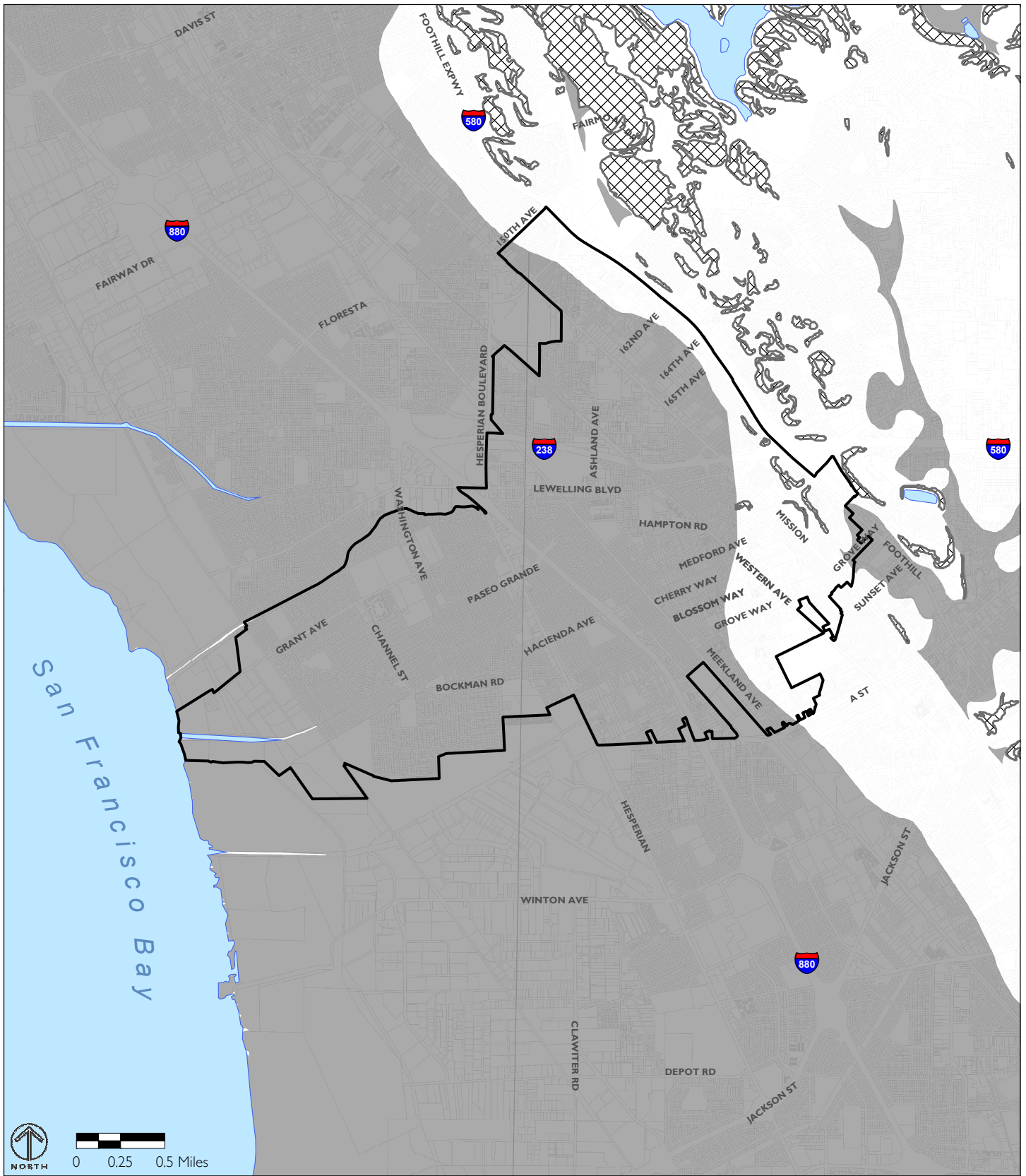
suspension, akin to quicksand. Landslides are common in hill areas and mountains where loose material and steep slopes combine to create unstable conditions. Instability may be exacerbated by earthquakes, stream and coastal erosion, heavy rainfall, extensive irrigation, poor drainage or groundwater withdrawal, removal of stabilizing vegetation and undercutting or overloading slopes for construction. Figure 8-2 shows liquefaction and landslide zones in the Eden Area.

4. Alquist-Priolo Zones

The *Alquist-Priolo Earthquake Fault Zoning Act*, which was passed in 1972 to mitigate the hazards of surface faulting to structures built for human occupancy, requires the State Geologist to delineate wide, special study zones to encompass all active and potentially active traces of the San Andreas, Calaveras, Greenville and Hayward Faults, as well as other such faults or fault segments deemed necessary. As shown in Figure 8-3, a portion of the Eden Area is subject to the Act.




The State Board of Mines and Geology is charged with establishing policies and criteria for future land use in Alquist-Priolo Hazard Zones, although local agencies must regulate most development projects within the zones. Before a project may be permitted in a Alquist-Priolo Hazard Zone, the associated city or county must provide a geologic survey that demonstrates that the proposed buildings will not be constructed across traces of active faults. Any evaluation and written report of a specific site must be prepared by a licensed geologist. If an active fault is found, no structure for human occupancy may be placed over the trace of the fault and structures must be set back from the fault, except as described below.⁹

⁹ State of California, State Geological Survey *Alquist-Priolo Earthquake Fault Zones* webpage, (<http://www.consrv.ca.gov/CGS/rghm/ap/> accessed on January 15, 2005).

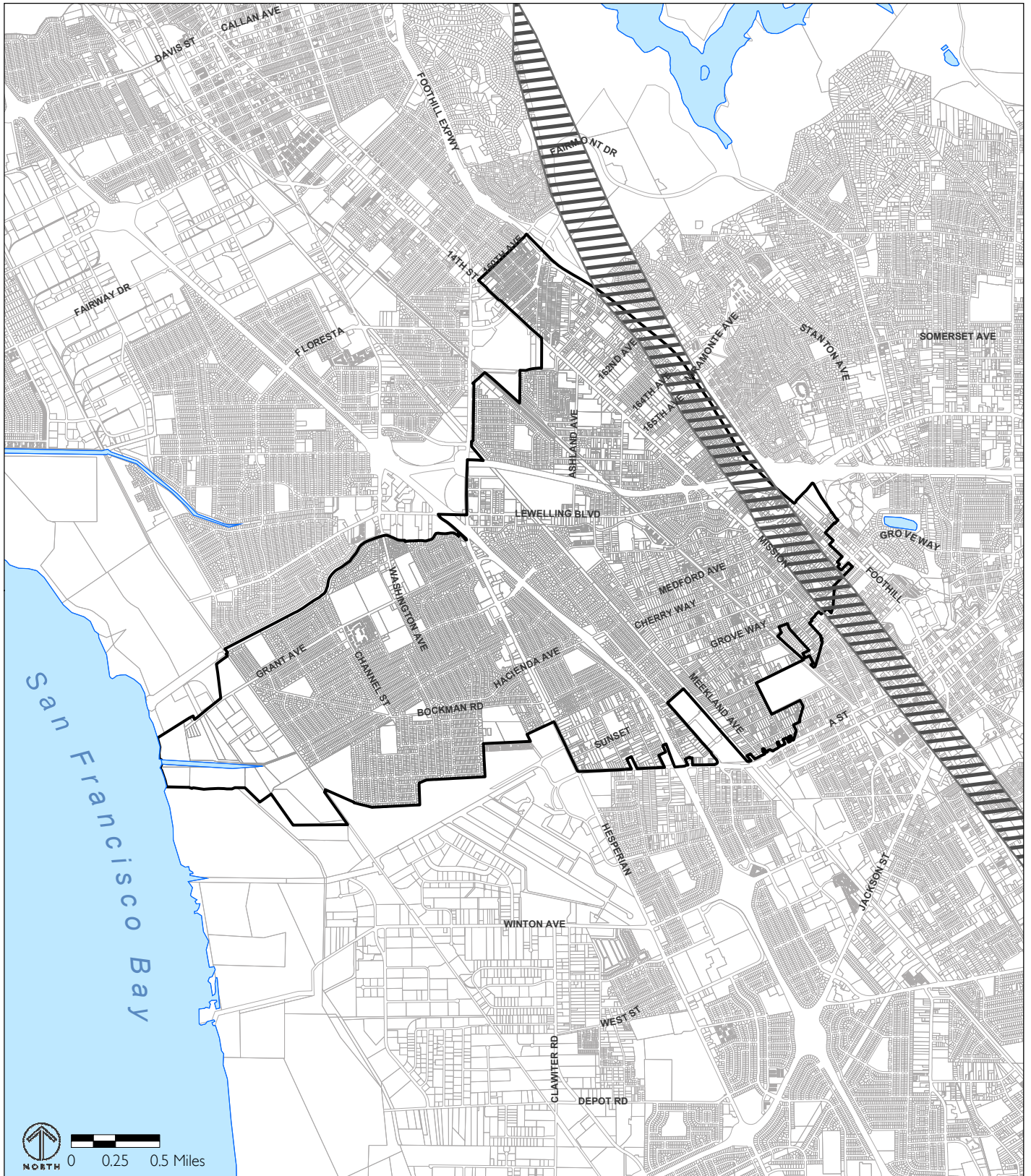


Source: California Department of Conservation, California Geological Survey, Seismic Hazard Zones: Hayward and San Leandro Quadrangles.

FIGURE 8-2

-  Study Area Boundary_April26
-  Landslide Zones
-  Liquefaction Zones

SECONDARY SEISMIC HAZARDS



Data Source: California Department of Conservation, Division of Mines and Geology
 GIS files of Official Maps of Alquist-Priolo Earthquake Fault Zones, Central Coastal Region
 Published 2001

FIGURE 8-3

 **Alquist-Priolo Zone**

**ALQUIST - PRIOLO ZONES
 IN THE EDEN AREA**

**COUNTY OF ALAMEDA
 EDEN AREA GENERAL PLAN**

A “structure for human occupancy” is defined as any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year. Single-family frame dwellings are exempt unless part of a development of four or more dwellings.

5. Uniform Building Code

Since the 1970s, the *Uniform Building Code (UBC)* in California has incorporated minimum standards to protect the life and safety of building occupants and the general public from earthquake-related damage. Buildings constructed in California prior to these code revisions generally do not meet current UBC design provisions for earthquake forces. Many of the buildings in the Eden Area, particularly houses and apartment buildings, were built before 1970 and thus may be susceptible to damage in the event of an earthquake.

6. Unreinforced Masonry Buildings

Unreinforced masonry buildings (URM) are categorically brick, stone or concrete buildings that were built without structural steel reinforcements. They represent a particular and significant earthquake hazard since they can easily collapse as a result of violent groundshaking. Most local jurisdictions in Alameda County adopted strong earthquake bracing provisions around 1950 and have subsequently used these, and more recent amendments to the building code, to regulate new development. However, a substantial number of buildings were built in the Eden Area before those codes were adopted. There is currently no comprehensive tally of unreinforced masonry buildings in the Eden Area.

In 1986, a bill was passed in the State Legislature requiring inspection and mitigation of all types of URM buildings within the State’s Seismic Safety Zone 4, which includes the Eden Area. This bill has since been codified as Government Code Section 8875 *et. seq.* The law requires cities and counties to identify potentially hazardous URM buildings, develop mitigation programs to reduce the hazards and submit the results to the State Seismic Safety Commission. Some unreinforced buildings are exempt from Section 8875,

including residential buildings with five or fewer living units, buildings owned by the federal or State government, and warehouses or similar buildings that have few occupants and no emergency services or supplies. Although historic buildings are also exempt, the Seismic Safety Commission recommends they be included in mitigation programs.

B. Goals, Policies and Actions

Goal SAF-1 Minimize the risks to lives and property due to seismic and geologic hazards.

Policies

- P1. Site specific geologic hazard assessments, conducted by a licensed geologist, shall be completed prior to development approval in areas with landslide and liquefaction hazards as indicated in Figure 8-2 and for development proposals submitted in Alquist-Priolo Zones as indicated in Figure 8-3. 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.

- P2. Buildings shall be designed and constructed to withstand ground shaking forces of a minor earthquake without damage, of a moderate earthquake without structural damage, and of a major earthquake without collapse of the structure. The County shall require that critical facilities and structures (e.g. hospitals, emergency operations centers) be de-

signed and constructed to remain standing and functional following an earthquake. Minor, moderate and major earthquakes are defined in Table 8-1.

- P3. All construction in the Eden Area shall conform with the Uniform Building Code and the Alameda County Building Code, which specify requirements for seismic design, foundations and drainage.
- P4. 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.
- P5. The County shall encourage the retrofitting of existing structures and other seismically unsafe buildings and structures to withstand earthquake ground-shaking.
- P6. New development in areas with the potential for landslides or liquefaction hazards, as indicated in Figure 8-2, shall not be approved 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.
- P7. 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.

Actions

- A1. 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 Geologist, 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.
- A2. Update existing secondary hazard maps as new data become available. These maps shall be used by the County to determine where further study is required, and shall not be used to determine where hazardous conditions exist.
- A3. 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.

2. FLOODING AND INUNDATION

Flooding is a concern in the Eden Area. There are locations near the San Francisco Bay that are subject to flooding under extreme conditions such as 100-year floods. These hazards are discussed in this section.

A. Background Information



San Lorenzo Creek

Flooding can cause damage to structures and personal belongings, and generate large volumes of downed trees and other vegetation, mud and soil, sandbags, plastic sheeting and household or demolition debris. The following are potential causes of local flooding.

1. Storm Drainage

In the Eden Area, stormwater runoff that does not infiltrate into the subsurface is directed into a constructed stormwater drainage system consisting of crowned streets, curbside gutters, drainage inlets, subsurface pipes, and engineered canals and creeks. Storm water in the Eden Area flows into three channels: the San Lorenzo Creek, Bockman Canal and Estudillo Canal. Estudillo Canal is located in the City of San Leandro. However, based on the current Federal Emergency Management Agency (FEMA) map and the information received from the Flood Control District, the system is at or above capacity for any flooding above a 15-year event. The San Lorenzo Creek begins just south of the Dublin grade and runs from east to west through Castro Valley and the Eden Area. Above Interstate 580, it flows freely before being directed into a concrete-lined, trapezoidal channel under the freeway. As it nears the San Francisco Bay, the channel has a sandy bottom and is tidally-influenced.¹⁰ San Lorenzo Creek was originally designed by the Corps of Engineers for a Standard Project Flood of approximately 9,700 cubic feet per second (cfs). However, the current 100-year discharge is in the order of 15,000 cfs, creating serious potential for inundations during such an event. A detailed study of the potential flooding area was conducted by the Flood Control District.¹¹

¹⁰ Personal communication with Emanuel Da Costa, Alameda County Flood Control & Water Conservation District, to DC&E on April 5, 2005. <http://www.baysavers.org/Programs/SLZ/tour.htm>.

¹¹ Personal Communication, Public Works Agency Alameda County, June 27, 2005.

The San Lorenzo Creek is part of the San Lorenzo Creek watershed, which encompasses approximately 48 square miles and seven creeks. The watershed begins in lightly developed hills to the east and north of Castro Valley and just south of the Don Castro Reservoir. The watershed covers parts of north Hayward and San Lorenzo and is the second largest watershed in the East Bay. Just south of Interstate 580, near Crown Canyon Road, the watershed enters a highly urbanized area.¹²

The Bockman Canal is considered to be its own watershed, which contains a series of storm drains and canals that drain the western part of San Lorenzo. The canal itself runs east to west through San Lorenzo. Like San Lorenzo Creek, Bockman Canal is concrete lined and tidal west of the Union Pacific railroad tracks.¹³ Based on recent studies, the open channel portion of the system may be adequate for a 100-year discharge, but the closed conduit portion – starting upstream of Channel Street and continuing all the way up to Interstate 880 – is under capacity for events greater and including a 15-year storm.¹⁴



San Lorenzo Creek

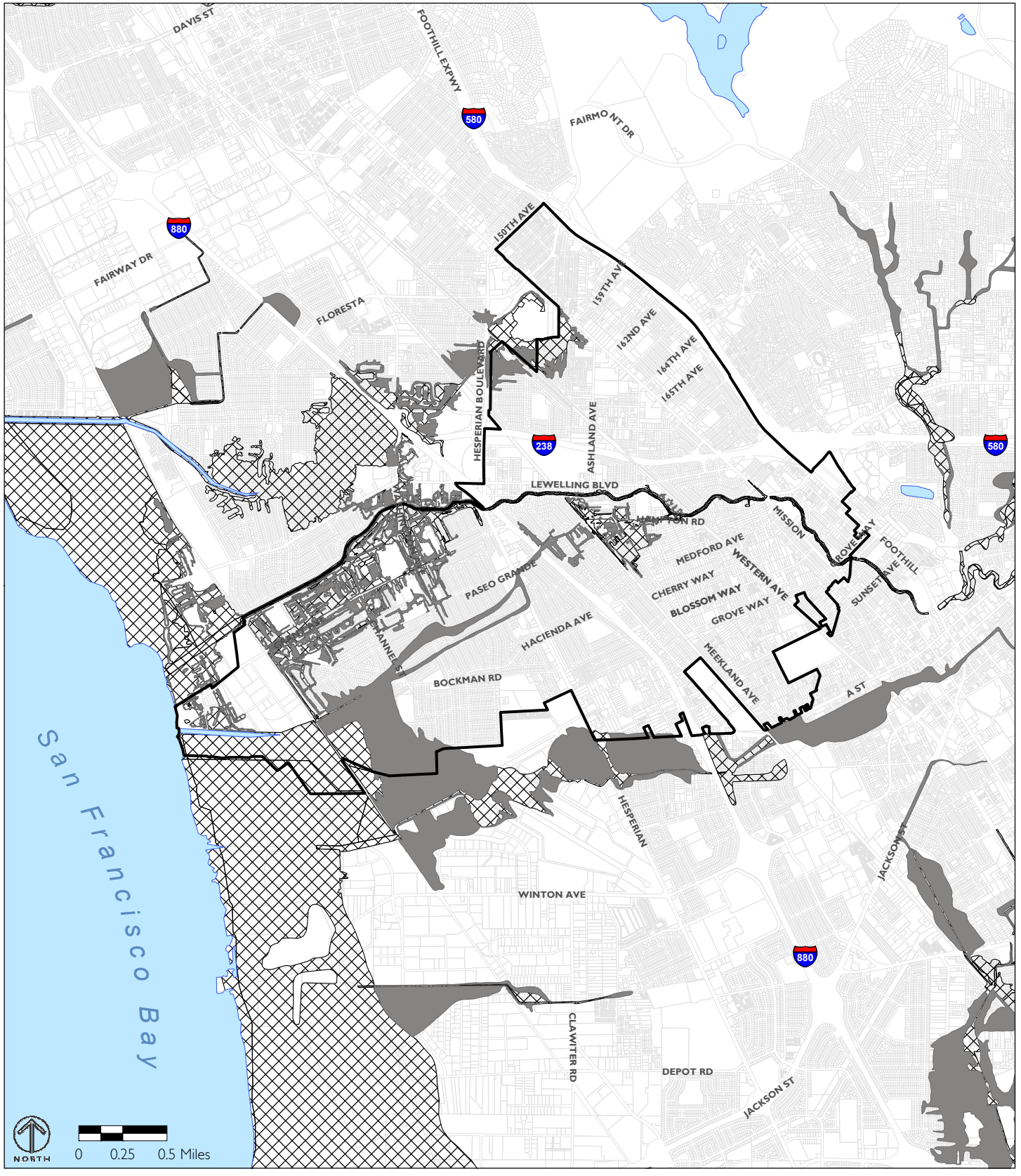
2. Current FEMA 100-Year and 500-Year Flood Plain

Portions of the Eden Area are subject to inundation from a 100-year flood, as shown in Figure 8-4. As defined by FEMA, a 100-year flood is not a flood that will occur once every 100 years; it is a flood that has a one percent chance of being equaled or exceeded each year. Thus, an area outlined as a 100-year flood zone could flood more than once in a relatively short period of time. Figure 8-4 also shows the portions of the Eden Area subject to inundation from a 500-year flood, which have a 0.2 percent chance of flooding in any given year.

¹² <http://www.baysavers.org/Programs/SLZ/tour.htm> accessed on April 5, 2005.

¹³ <http://www.museumca.org/creeks/28-RescBockman.html> accessed on April 5, 2005.




¹⁴ Personal communication, Public Works Agency Alameda County, June 27, 2005.



Source: FEMA Flood Insurance Rate Maps, Digital Q3 data.

FIGURE 8-4

**100 & 500 YEAR
FEMA FLOOD ZONES**

-  Study Area Boundary
-  500 Year FEMA Flood Zone
-  100 Year FEMA Flood Zone

Revisions to the Flood Insurance Rate Maps (FIRMs) in December 2007 changed the boundaries of the 100-year and 500-year flood zones in the Eden Area, mostly expanding them, but also contracting them in some areas. As a result, there are approximately 600 more parcels, including single-family and multiple-family residential units, within the 100-year flood zone, and 500 more parcels within the 500-year flood zone, than were shown in previous versions of the FIRMs.

The 100-year flood, which is the standard used by most federal and state agencies, is also used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. A structure located within a special flood hazard area shown on an NFIP map has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage.

The Alameda County Building Inspection Division, which reviews permits for compliance with its flood hazard abatement codes and regulations, addresses the potential for flooding from a 100-year flood at individual sites when specific development is proposed.

3. Tsunamis

A tsunami is a series of long waves generated by any sudden displacement of a large volume of water. Tsunamis can be triggered by a number of submarine phenomenon including earthquakes, volcanic eruptions, landslides, meteor impacts and onshore slope failures that fall into the ocean or bay. Tsunami waves can travel across entire ocean basins as well as enter into bays and inlets, sometimes rising as much as 40 feet above sea level before hitting land. The USGS has estimated that the San Francisco Bay will experience a 20-foot high tsunami at a frequency of once every 200 years. The wave height would reduce by half as it reaches the Albany/Berkeley shoreline and decrease fur-

ther as it travels south. The Eden Area would be subject to some level of inundation from a tsunami of this magnitude.¹⁵

4. Seiches

Seiches are waves generated in an enclosed body of water, such as the San Francisco Bay, from seismic activity. Seiches are related to tsunamis for enclosed bays, inlets, and lakes. These tsunami-like waves can be generated by earthquakes, subsidence or uplift of large blocks of land, submarine and on-shore landslides, sediment failures and volcanic eruptions. The strong currents associated with these events may be more damaging than inundation by waves. The largest seiche wave ever measured in the San Francisco Bay, following the 1906 earthquake, was four inches high. The Bay Area has not been adversely affected by seiches during its history within this seismically active region of California.¹⁶



Drainage ditches help to mitigate flooding hazards

5. Flood Control Activities

The Alameda County Flood Control District (District) has participated voluntarily in the Community Rating System Program (CRS) since 1992. This national program, offered by FEMA's NFIP, provides credit points to the District for instituting more effective floodplain management than is required as a minimum by the federal government.

Between 1994 and 1999, Alameda County has received sufficient credit in the CRS program to qualify Eden Area residents living in flood hazard areas for a 10 percent discount in their federal flood insurance premiums. In 1999, the Public Works Agency, which administers the CRS program in the Eden Area, earned sufficient credits to earn an additional 5 percent reduction for Eden Area residents in flood hazard areas, for a total of 15 percent.

¹⁵ Alameda County Waste Management Authority, *Disaster Waste Management Plan*, Table 2-1.

¹⁶U.S. Army Corps of Engineers San Francisco District, Port of Oakland. *Oakland Harbor Navigation Improvement (-50 Foot) Project SCH No. 97072051 Final Environmental Impact Statement/Report*, May 1998, Updated January 2000.

B. Goals, Policies and Actions

Goal SAF-2 Reduce hazards related to flooding and inundation.

Policies

- P1. 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.
- P2. Both public and private service facilities and utilities in existing 100-year flood zones, such as the Oro Loma Wastewater Treatment Plant, shall be flood-proofed to a point at, or above, the base flood elevation.
- P3. 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.

- P4. 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 areas may be reduced.
- P5. Property owners should be encouraged to purchase National Flood Insurance, which reduces the financial risk from flooding and mudflows.
- P6. Development shall comply with applicable NPDES requirements.

Actions

- A1. 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.
- A2. Monitor potential changes in information regarding tsunami hazards for the Eden Area.

Goal SAF-3 Improve the ability of the San Lorenzo Creek to handle 100-year flood events.
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Policies

- P1. The County shall ensure that any changes to the San Lorenzo Creek drainage channel will result in the continued ability to accommodate runoff from storms and to maintain a status outside the 100-year flood zone.
- P2. The County shall not permit the flow of the San Lorenzo Creek to be diverted in any way that results in flooding to adjacent property owners.

Actions

- A1. The County should develop a program, based on studies conducted by the Alameda County Flood Control District, to ensure improvements to the San Lorenzo Creek drainage channel or Bockman canal will result in the continued ability to accommodate runoff from storms and to maintain its status outside a 100-year flood event.

- A2. The County will work with local jurisdictions and other stakeholder agencies to implement the recommendations of the San Lorenzo Watershed Drainage Master Plan.

3. WILDLAND FIRES

The Eden Area does not fall within any Very High Fire Hazard Severity Zones (VHFHSZ), although the hillside area to the northeast of Ashland is within a VHFHSZ. Therefore, wildland fires are not a concern in the Eden Area.

4. HAZARDOUS MATERIALS

Products as diverse as gasoline, paint, solvents, film processing chemicals, household cleaning products, refrigerants and radioactive substances are categorized as hazardous materials. What remains of a hazardous material after use or processing is considered to be a hazardous waste. The handling, transportation and disposal of such wastes is of concern to all communities. Improper handling of hazardous materials or wastes may result in significant effects to human health and the environment. Hazardous waste may pose risks to human health and safety in the form of serious health problems and to the environment through contamination of water and air.

A. Background Information

Nearly all businesses and residences in the Eden Area generate some amount of hazardous wastes. The most common industrial hazardous wastes in the Eden Area are generated from gasoline service stations, dry cleaners, automotive repair shops, machine shops, printers and photo processors. Most of these wastes are petroleum-based or hydrocarbon hazardous waste and include cleaning and paint solvents, lubricants and oils. In addition, medical wastes such as potentially infectious waste from laboratories, clinics and hospitals, are also included among the hazardous wastes found in the Eden Area.

Hazardous materials are heavily regulated by a range of federal, State and local agencies. One of the primary hazardous materials regulatory agencies is the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). DTSC is authorized by the US Environmental Protection Agency (EPA) to enforce and implement federal hazardous materials laws and regulations. DTSC has responsibility for oversight of all Annual Work Plan sites (commonly known as State Superfund sites) which are sites designated by EPA as having the greatest potential to affect human health and the environment. There are no Superfund sites in the Eden Area.

The Alameda County Environmental Health has primary responsibility for enforcing most regulations pertaining to hazardous materials in the Eden Area. The Alameda County Fire Department acts as first responder to hazardous materials incidents within the Eden Area.

Hazardous waste programs in the Eden Area are also governed by the *Alameda County Hazardous Waste Management Plan* and the *Alameda County Integrated Waste Management Plan*. These plans include forecasts for the generation of hazardous waste and provide policies for the management of this waste in Alameda County. The primary focus of both plans is to reduce the amount of hazardous waste generated in the County and to safely reuse, recycle or store any waste that is generated.

In addition to the programs and plans mentioned above, the Alameda County Household Hazardous Waste Program is operated as a partnership between the Alameda County Department of Environmental Health and the Alameda County Waste Management Authority. Eden Area residents may take their household hazardous waste to any of three collection facilities located in Hayward, Oakland and Livermore. Approximately 233,982 tons of hazardous waste (or 9.53% of total non-commercial hazardous waste) was received by the Alameda County Household Hazardous Waste program from households in Eden Area zip codes during fiscal year 2003.¹⁷

B. Goals, Policies, and Actions

Goal SAF-4 Minimize Eden Area residents' exposure to the harmful effects of hazardous materials and waste.

Policies

- P1. 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 wastes.
 - ◆ Treat or incinerate residual hazardous waste.
 - ◆ Place reduced or untreatable waste in secure land disposal units.

¹⁷ Zip codes were used to define the area because this is the level at which the Alameda County Waste Management Authority Household Hazardous Waste Program collects data. Zip codes used to approximate the Eden Area were 94541, 94546, 94578 and 94580. Personal communication with William Pollock, Alameda County Waste Management Authority Household Hazardous Waste Program to DC&E on November 9, 2004.

- P2. New or expanding businesses shall be required to demonstrate compliance with the hierarchy of waste management strategies listed in Policy 1 of this Goal as a condition of receiving land use and business permits.
- P3. All existing hazardous waste generators shall be required to implement the hazardous waste management hierarchy listed in Policy 1 of this Goal to the maximum extent feasible, both technically and economically.
- P4. 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*.
- P5. Adequate separation shall be provided between areas where hazardous materials are present and sensitive uses such as schools, residences and public facilities.
- P6. 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.
- P7. The safe transport of hazardous materials through the Eden Area 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.
- P8. Emergency response plans shall be submitted as part of all use applications for any large generators of hazardous waste.
- P9. To the extent feasible, the County shall continue to support the removal of hazardous wastes from the solid waste stream in the Eden Area in accordance with Countywide plans.

Actions

- A1. 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 1 of this Goal.
- A2. 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.

5. EMERGENCY PREPAREDNESS

Emergency preparedness is an important aspect of minimizing potential damage that may occur in the event of a disaster. Public education, predetermined evacuation routes and coordination among emergency response agencies are key components to an effective strategy for dealing with any potential hazard.

A. Background Information

As required by State law, Alameda County has established emergency preparedness procedures to be prepared for and respond to a variety of natural and man-made disasters that could confront the community. Emergency and disaster planning is primarily conducted through the Public Health Department, in collaboration with other County departments. Resources are also available to the public at the Department of Public Health website.¹⁸

B. Goals, Policies, and Actions

Goal SAF-5 Prepare and keep current County emergency procedures in the event of potential natural or man-made disaster.
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Policies

- P1. The County shall coordinate with emergency response agencies in adjacent jurisdictions to prepare for natural and man-made disasters.
- P2. Adequate emergency water flow, emergency vehicle access and evacuation routes shall be incorporated into any new development prior to project approval.

Actions

- A1. Complete regularly scheduled reviews and updates of the emergency preparedness plan.

¹⁸ <http://www.acphd.org/> accessed on April 14, 2005.

- A2. Conduct periodic mock exercises using emergency response systems to test the effectiveness of County procedures included in the emergency management plan.
- 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.
- A4. Work with Caltrans, and the local and Countywide fire and police departments to identify appropriate emergency access routes through the Eden Area.

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