



CITY OF EMERYVILLE LOCAL HAZARD MITIGATION PLAN JUNE 2009



**City of Emeryville
Local Hazard Mitigation Plan**

June 2009

(SAMPLE)

**RESOLUTION NO. _____
RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EMERYVILLE
ADOPTING A LOCAL HAZARD MITIGATION PLAN**

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster All Hazards Mitigation Plan to be eligible for Federal Emergency Management Agency pre- and post-disaster mitigation funds; and

WHEREAS, the City of Emeryville recognizes that no jurisdiction is immune from natural, technological or domestic security hazards, whether it be earthquake, flood, extreme weather, or wildfire related; and recognizes the importance of enhancing its ability to withstand hazards as well as the importance of reducing human suffering, property damage, interruption of public services and economic losses caused by those hazards; and

WHEREAS, the Federal Emergency Management Agency and California Emergency Management Agency have developed a hazards mitigation program that assists jurisdictions in their efforts to become Disaster-Resistant entities that focus, not just on disaster response and recovery, but also on preparedness and hazard mitigation, which enhances economic sustainability, environmental stability and social well-being; and

WHEREAS, the City of Emeryville fully participated in the Federal Emergency Management Agency prescribed mitigation-planning process to prepare this Local Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED that the City of Emeryville City Council adopts the “City of Emeryville Local Hazard Mitigation Plan” as an official Plan; and

BE IT FURTHER RESOLVED, the City of Emeryville, through the Economic Development and Housing Department, will submit this Adoption Resolution to the California Emergency Management Agency and Federal Emergency Management Agency officials to enable the Plan’s final approval.

ADOPTED by the Emeryville City Council at a regular meeting held on Month, Day, Year by the following vote:

AYES: _____
NOES: _____ ABSENT: _____
EXCUSED: _____ ABSTAIN: _____

Mayor

ATTEST: APPROVED AS TO FORM

City Clerk

City Attorney

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1. Purpose / Vision / Values

Purpose of Local Hazard Mitigation Plan (LHMP)

The purpose of this Local Hazard Mitigation Plan (LHMP) is to reduce or eliminate long-term risks to the people and property of the City of Emeryville (City) from natural and man-made hazards. The City of Emeryville’s LHMP is the representation of the City’s commitment to reduce risks from natural and other hazards and serves as a guide for decision-makers as they commit resources to reducing the effects of natural and other hazards. The City’s LHMP serves as a basis for the California Emergency Management Agency (CalEMA) to provide technical assistance and to prioritize project funding. (See IFR §201.6).

While the Disaster Mitigation Act of 2000 (“DMA 2000”) requires that local communities address only natural hazards, the Federal Emergency Management Agency (FEMA) recommends that local comprehensive mitigation plans address man-made and technological hazards to the extent possible. Towards that goal, the City of Emeryville has addressed an expansive set of hazards.

The City of Emeryville is required to adopt a federally-approved Local Hazard Mitigation Plan to be eligible for certain disaster assistance and mitigation funding. The overall intent of this LHMP is to reduce or prevent injury and damage from hazards. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. This LHMP also guides hazard mitigation activities by establishing hazard mitigation goals and objectives.

The LHMP is a “living document” that will be reviewed and updated annually to reflect changing conditions and improvements by new information, especially information on local planning activities. The LHMP is written to meet the statutory requirements of DMA 2000 (P.L. 106-390), enacted October 30, 2000 and 44 CFR Part 201 – Mitigation Planning, Interim Final Rule, published October 28, 2003.

Support of Broader City of Emeryville Vision

This LHMP supports the broader mission and vision of the City of Emeryville as reflected in their following Mission Statement:

Mission Statement

The City of Emeryville provides innovative and responsive services to the community to create and sustain a vibrant, livable and safe city.

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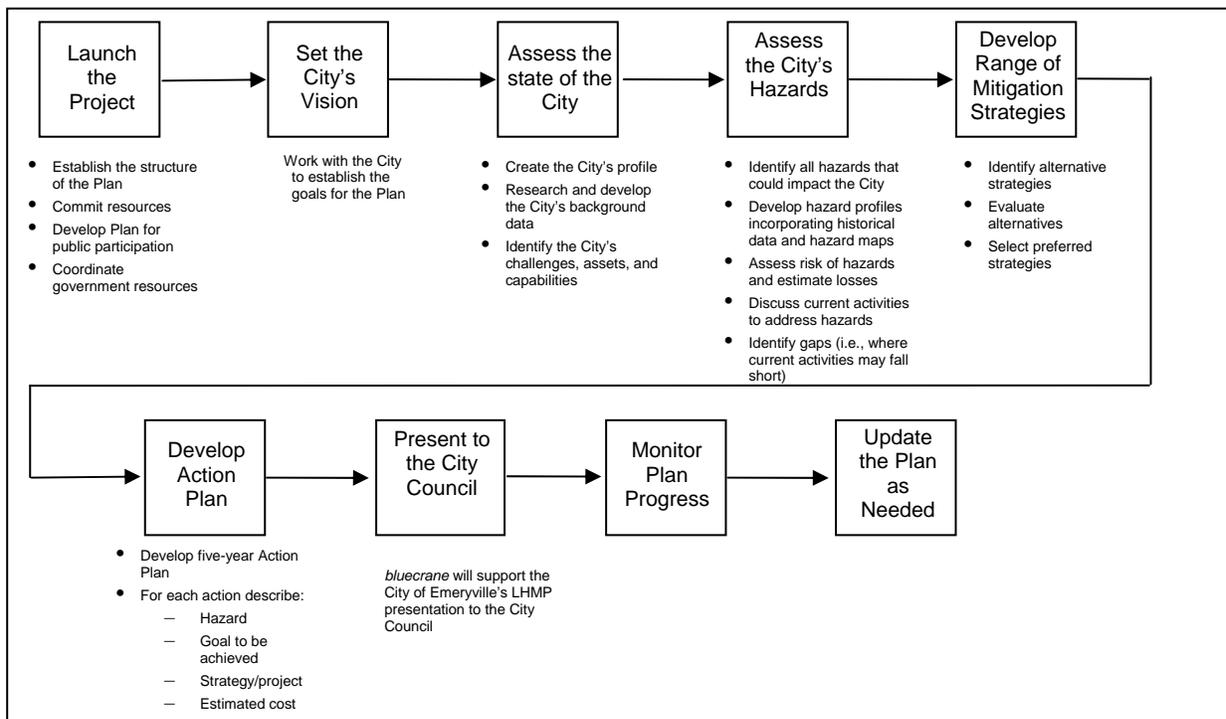
2. The Planning Process

The City of Emeryville was responsible for the development of the LHMP. The City hired a consultant, Bluecrane, Inc., (*bluecrane*) to assist in the preparation of the LHMP and has formed a planning committee, the Hazard Mitigation Working Group, with representatives from the following Departments:

- Economic Development and Housing Department
- Public Works Department
- Planning and Building Department
- Fire Department
- Police Department

The individuals from these Departments, as members of the Hazard Mitigation Working Group, were responsible for communicating with and soliciting input from all applicable units, offices and division within their Departments as the LHMP progressed through the various stages of development. In this manner, all units, offices and divisions from each of the participating Departments as noted above were fully involved in the development of the LHMP.

The figure below depicts the planning process utilized by the City of Emeryville.



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The goals and objectives of the LHMP identified by the Hazard Mitigation Working Group are to:

- Reduce risk to existing facilities from hazards
- Prevent loss of services
- Protect public health and safety
- Improve education, coordination, and communication with stakeholders and the public

LHMP Meeting Schedule

Following the Emeryville City Council’s approval of the project, the effort was launched on September 24, 2008 by a project kickoff meeting of the Hazard Mitigation Working Group, in Emeryville, California. The meeting was facilitated by the Community Economic Development Coordinator of the Economic Development and Housing Department and the professional planning contractors from Bluecrane, Inc. The Hazard Mitigation Working Group was comprised of the City Directors and staff from the following Departments:

- Economic Development and Housing Department
- Public Works Department
- Planning and Building Department
- Fire Department
- Police Department

During this meeting the scope of work, introduction to DMA regulations, the role of the planning contractor, local hazards identification, hazard data collection needs, and an overall timeline were discussed.

The Hazard Mitigation Working Group has participated actively in the LHMP’s development. Communications during the planning process involved face to face meetings, phone interviews, e-mail correspondence, and conferring every two to three weeks throughout the process to review draft documents and assess the progress of the Plan.

In addition to the steps shown in the figure above, an extensive effort was undertaken to solicit public input during the planning process through newsletters, website postings, newspaper announcements, and invitations to public discussions and activities. Public comments and input included neighboring communities, agencies, businesses, academia, non-profits and other interested parties. The typical agenda for the interactive information sharing and input gathering sessions with the public included:

- Introductions of the Hazard Mitigation Working Group and planning contractor
- An overview of the LHMP purpose and process
- A detailed interactive discussion of each hazard
- Solicitation of all comments
- An interactive discussion of the next steps
- A broad overview of the draft LHMP as it stood at that time

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In the ongoing effort to include presentations, discussions and input gathering for the LHMP in all relevant City meetings and interaction with the public, the following table list the formally scheduled meetings and public announcements conducted.

Table 2.1. Schedule of LHMP Meetings

Date	Event
September 24, 2008	Hazard Mitigation Planning Committee Meeting – Kickoff Session
April 20, 2009	Hazard Mitigation Working Group Mitigation Workshop
April 29, 2009	Local Hazard Mitigation Plan draft posted on the City of Emeryville’s website and displayed at the Economic Development & Housing Department reception area, Police Department, and Fire Department for public review
May 7, 2009	City of Emeryville Local Hazard Mitigation Plan open forum for public input
Date	City Council open forum/approval of the Local Hazard Mitigation Plan

Documents that Contributed to the Foundation of the LHMP

The City of Emeryville’s General Plan, Management Operation Plan and Fire Department Memorandums related to Response to Risks and the Preliminary Risk Assessment, contributed to the foundation of this integrated LHMP.

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3. The City of Emeryville

The City of Emeryville, one of the smallest cities in California, covers an area of 2.25 square miles of which approximately 1.2 square miles is land area and one square mile is tidal on San Francisco Bay. Emeryville is located in Alameda County, bordered by the cities of Berkeley to the north, Oakland to the east and south, and the San Francisco Bay to the west.

General Law City

Emeryville is a general law city, restricted to the exercise of powers specifically outlined in State general law. This is in contrast with a charter city whose broader range of powers are locally set by an original charter voted on by the city's electorate.

Governing Bodies

Emeryville has a City Council-City Manager form of government. Under this form of government the Emeryville City Council is the legislative body responsible for setting City policy and adopting the City budget. The five City Council members are elected at-large by the Emeryville electorate for a four-year staggered term. Elections are held in odd-numbered years, with three Council members elected in one cycle and two Council members elected in the alternate cycle. Council members must be electors of the City and must have been residents of the City for the year preceding the election. Every year, the five City Council members select a Mayor and Vice-Mayor from among themselves. The City Council members also serve as the Emeryville Redevelopment Agency.

The City Council appoints a City Manager, who is the administrative head of the city government and also serves as the Executive Director of the Redevelopment Agency. The City Manager is responsible for policy implementation and management of all city operations. The City Manager advises and makes recommendations to the City Council concerning any conditions or situations which require Council direction or policy determination and prepares the recommended budget for consideration and approval by the City Council.

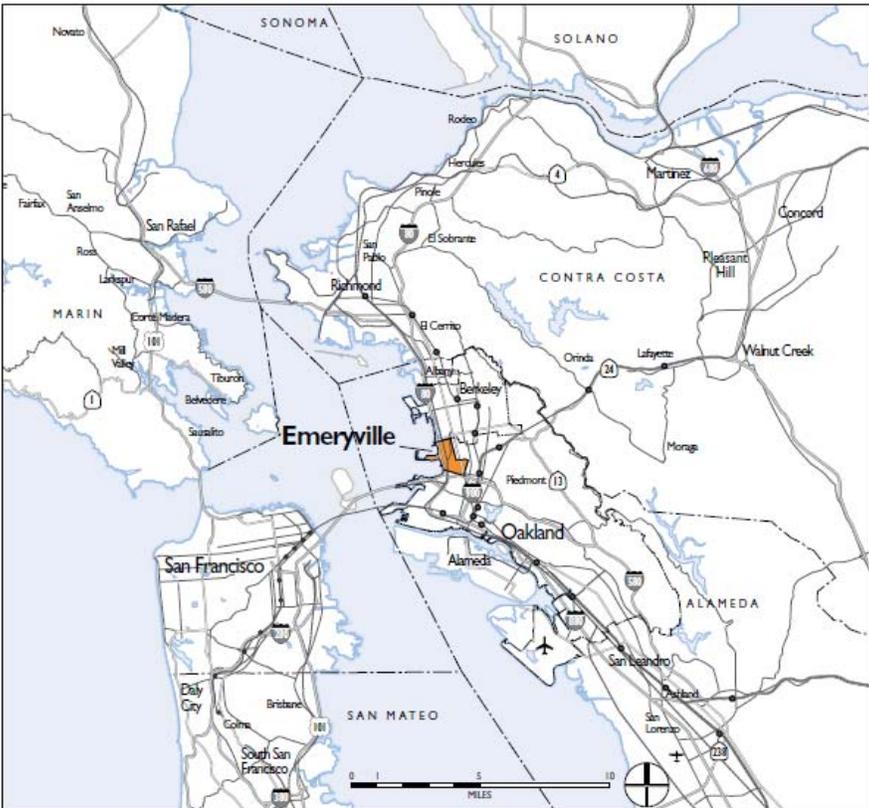
The Emeryville Redevelopment Agency is the governmental body responsible for directing and overseeing the goals and objectives of the City's Redevelopment Plans.

The following maps show the location of the City of Emeryville.

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FIGURE 1-1
Regional Context



1-8

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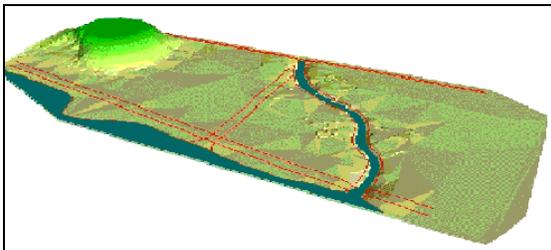
Historical Setting

Emeryville was incorporated in 1896 as a city of industry and business at transportation cross-roads. It was named after Joseph Stickney Emery who arrived during the Gold Rush and acquired large tracts of land in what became known as "Emery's".

After settlement by Europeans, Emeryville became a city in its own right, largely through the efforts of businessman Joseph S. Emery. Emery came to California in 1850 looking for gold, but eventually started a stonework contracting business in San Francisco. In 1859, Emery purchased a 185-acre tract of land north of Oakland and began to develop projects in the area. A community began to develop around the Emery Tract, and the town of Emeryville was officially incorporated in 1896, taking the name of its founder. The Emeryville town hall was completed in 1903, and still stands as the center for local government today.

Before the colonization of the Emeryville area by Spain in 1776, this area was the site of extensive Native American settlements. Mudflats rich with clams and rocky areas with oysters, plus fishing, hunting, and acorns from the local oak trees provided a rich and easily exploited food source for the residents, who disposed of their clam and oyster shells in a single place, over time creating a huge mound, now called the "Emeryville Shellmound".

The Emeryville Shellmound was a once-massive archaeological shell midden deposit (dark, highly organic soil containing a high concentration of human food waste remains, including shellfish). It was one of a complex of five or six mounds along the mouth of the perennial Temescal Creek, on the east shore of San Francisco Bay between Oakland and Berkeley. From a time long before the arrival of the Europeans in 1769, groups of Native Americans lived at this spot by the Bay. The mound constituted a small hill and was physically linked to several adjacent mounds by extensive lower-lying midden deposits. Its peak likely provided sweeping views of the Bay.



The Emeryville Shellmound was a steep-sided cone, with a buried base over eight feet deep. Before it was leveled in 1924 the total height of the deposit was as much as 40 feet--as high as a four story building--and over 350 feet in diameter--as long as a football field.



This vintage photo shows a steam shovel demolishing of the Emeryville Shellmound in 1924 to make way for a paint factory.

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Evidence indicates that the site was a large village, occupied from at least 2800 years ago to 400 years ago. It was also used by Native Americans as a resting-place for their dead. The site was recognized as an archaeological deposit from the time of the first historically recorded settlement of the East Bay, and was subjected to some of the earliest archaeological excavations in the United States. The site of the Shellmound is now a California Historical Landmark (#335).

After several decades of decline as major industries closed and relocated, Emeryville has remade itself into a dynamic mixed-use community, home to global leaders in film-making, biotechnology, software, and other knowledge industries; a retail and entertainment destination; and a growing residential center.

Community

Emeryville's proximity to San Francisco, the Bay Bridge, the University of California, Berkeley, and Silicon Valley has been a catalyst for recent economic growth. Emeryville is home to Pixar Animation Studios, Peet's Coffee & Tea and Jamba Juice. In addition, several well known biotech and software companies have made their home in Emeryville, i.e., LeapFrog, Sendmail, MobiTV, and Chiron (recently acquired by Novartis).

Following the Loma Prieta Earthquake in 1989, a new Amtrak depot was built in Emeryville to replace the old 16th Street Station in West Oakland, which had been deteriorating even before it was seriously damaged by the quake. The Emeryville station serves Amtrak's California Zephyr, Coast Starlight, San Joaquin, and Capitol Corridor trains. The California Zephyr originates here with service daily to Chicago, Illinois via Salt Lake City, Utah and Denver, Colorado. Buses link the station with San Francisco.

Geography

Emeryville is largely flat and is distinguished by a peninsula created in the 1960s that runs a little over a mile into the Bay.

Climate

Emeryville's climate is mild during summer when temperatures tend to be in the 60's and cool during winter when temperatures tend to be in the 50's. The warmest month of the year is September with an average maximum temperature of 74.60 degrees Fahrenheit, while the coldest month of the year is January with an average minimum temperature of 44.70 degrees Fahrenheit. Temperature variations between night and day tend to be fairly limited during summer with a difference that can reach 15 degrees Fahrenheit and fairly limited during winter with an average difference of 13 degrees Fahrenheit. The annual average precipitation at Emeryville is 22.94 inches. Winter months tend to be wetter than summer months. The wettest month of the year is January with an average rainfall of 4.85 inches.

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Population

Since 1993, the City's population has soared by 34 percent, while employment has increased by an even greater amount - 43 percent. In effect, the City's population more than doubled (increasing by 122 percent) between 1980 and 2005 (from 3,714 in 1980 to 8,261 in January 2005). While employment in the City has held steady in the last five years (increasing by just 280 jobs), population growth has accelerated, with nearly 1,400 residents added in the period.

According to the Association of Bay Area Governments (ABAG) population estimates, the City was one of the fastest growing in the Bay Area between 1990 and 2000. Its population grew nearly 20 percent, exceeding the growth of approximately 13 percent in both Alameda County and the Bay Region during the same period. Rapid population growth in Emeryville is expected to continue in the future. In one year alone (January 1, 2007 to January 1, 2008), the City's population grew by 6.5 percent—the second highest growth rate in the Bay Area.

Labor and Employment

Emeryville has undergone significant changes over the past two decades as the City has shifted from its traditional industrial-based economy to technology, retail, and residential-based growth. Emeryville's central Bay Area location, easy regional access, and favorable business climate have enabled it to capture a disproportionate (given its size) amount of the region's explosive growth.

Emeryville has been a significant job generator for the East Bay. This is due not only to a convenient location and regional accessibility, but also to the City's proximity to the University of California at Berkeley, the presence of major corporations such as Chiron and Pixar that have helped to stimulate and sustain growth, and the entrepreneurial and dynamic character of the City. Emeryville's successful efforts to attract retail uses on a regional level have also contributed to increasing employment.

Jobs far exceed residents: in 2000, Emeryville's population was 6,882 (or less than one percent of the County total) while the number of jobs was estimated by ABAG at 19,860 (about 2.7 percent of the County total). The City enjoyed rapid employment increases between 1990 and 2000, with the number of jobs growing from 13,840 to 19,860, a gain of over 6,000. This represents a 43 percent increase compared to 21 percent in the County and 22 percent in the Bay Area during the same period.

ABAG projects that the City will continue its positive growth trends, though at a decreasing rate, between 2000 and 2030. It is expected that an additional 2,360 new jobs, representing a 12 percent increase, will be added during this period. The slower rate of job growth in the future may be attributable to a number of factors, including the small size (1.2 square miles) and build-out of the City, lack of readily developable (and clean) sites, and increasing environmental concerns (i.e., traffic congestion), which may affect the potential of future development in Emeryville.

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According to the 2000 U. S. Census Bureau, the median income for a household in Emeryville is \$45,359, and the median income for a family is \$57,063. The per capita income for the City is \$33,260. 13.2 percent of the population and 6.3 percent of families are below the poverty line. Out of the total population, 4.5 percent of those under the age of 18 and 8.0 percent of those 65 and older are living below the poverty line.

Transportation Systems

Amtrak. Full-service Amtrak station provides train and bus service through the Bay Area.

BART. Bay Area Rapid Transit serves over three million people in the three BART counties of Alameda, Contra Costa, and San Francisco, as well as northern San Mateo County.

Air. Oakland International is located approximately 10 miles from Emeryville. San Francisco International (the fifth largest airport in the U.S.) is located approximately 15 miles south of San Francisco, provides domestic and international flight service. San Jose International is located two miles north of San Jose, and mostly caters to residents of Silicon Valley.

Bus. Alameda-Contra Costa Transit (AC Transit) is the third largest public bus system in California, serving 13 cities and adjacent unincorporated areas in Alameda and Contra Counties.

Shuttle. Emery Go Round is a free shuttle to Emeryville from MacArthur BART and Emeryville Amtrak train stations.

Points of Interest

Emeryville Celebration of the Arts: Annual, juried art exhibition takes place during the month of October.

Pro Arts Gallery: A nonprofit organization fosters and supports the arts in the East Bay, including artists' open studios each June.

University of California at Berkeley: This famous university is located only 3.5 miles from Emeryville, and offers free tours of campus and other visitors' services.

Lawrence Hall of Science: Situated on the UC Berkeley campus, Lawrence Hall is a multi-purpose facility, serving as a family science center, educator resource, and center for curriculum development.

Zellerbach Hall: Entertainment center at UC Berkeley offers world-famous performances of music, dance, theater, and other.

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Oakland Museum of California: Only museum dedicated exclusively to the art, history, environment, and people of California.

Jack London Square: Oakland's waterfront shopping, dining, and entertainment destination.

Berkeley Repertory Theater: Professional, regional theater group established in 1968 has developed a national reputation for its quality productions and innovative programming.

City of San Francisco: San Francisco is located directly across the bay from Emeryville.

The University of California Botanical Garden: Located in Strawberry Canyon above the Berkeley campus, the Garden features one of the most diverse plant collections in the U. S.

Chabot Space and Science Center: Astronomy and space sciences learning center offers an observatory, a planetarium, and special exhibits.

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Local Capabilities Assessment

This section lists the City’s strategy to utilize resources to achieve goals of reducing losses from future hazard events. Following are the human and technical resources available to engage in mitigation planning processes and a list of financial resources and funding sources which affect or promote mitigation.

Administrative and Technical Capability	
Human Resources	Department/Agency/Resources
Emergency Managers	City Manager Economic Development and Housing Department Fire Department Police Department Public Works Department Planning and Building Department Other Department Managers Mutual Aid Agreements with the Fire Departments of Oakland, Berkeley and other fire agencies within Alameda County
Planner(s) or Engineer(s) with knowledge of land development, land management practices, construction practices related to buildings and/or infrastructure	Planning and Building Department Public Works Department Economic Development and Housing Department Engineering Specialists CAD/GIS Specialists Facilities Managers Construction Managers/Supervisors
GIS expertise	CAD/GIS Specialist
Grant writers	Department Heads

Financial Resources for Hazard Mitigation Projects
General Fund
Enterprise Fund (These funds are restricted to specific use, i.e., solid waste enterprise fund)
Development fees (Restricted to expansion costs for new development)
Building Permit fees
Capital Improvements project funding
Fees for water, sewer, gas, or electric service
Impact fees for homebuyers or developers for new developments/homes
Government and Park Impact fees
State Funding Sources: Infrastructure State Revolving Fund (ISRF) Program Proposition 13

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Financial Resources for Hazard Mitigation Projects

Caltrans
California State Water Resources Control Board (SWRCB) Proposition 40
California State Water Resources Control Board (SWRCB) Proposition 50
California State Water Resources Control Board Underground Storage Tank (UST) Program
Clean Water State Revolving Fund (SRF) Program
Proposition 84 Integrated Regional Water Management Program
Proposition 1E Disaster Preparedness and Flood Prevention Bond Act of 2006
California State Department of Water Resources, Division of Local Assistance, Davis-Grunsky Act Program
Watershed Protection Program
California Fire Alliance
California Fire Safe Council (Grants Clearinghouse – distributes some Federal National Fire Plan Grants in California)

Federal Funding Sources:

FEMA (Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, Pre-Disaster Mitigation Program, Severe Repetitive Loss Program)
U.S. Environmental Protection Agency Brownfields Economic Redevelopment Initiative
U.S. Environmental Protection Agency
Housing and Urban Development (HUD) Community Development Block Grant Program
Federal Economic Development Administration, Department of Commerce
U.S. Army Corp of Engineers (USACE)
U.S. Small Business Administration (SBA) Funding
Natural Resources Conservation Service (NRCS)
Environmental Quality Incentives Program (EQIP)
Small Watershed Program
Flood Prevention Program
Emergency Watershed Protection (EWP) Program
Homeland Security Grants (Terrorism)
Homeland Security Grant (Staffing Adequate Fire and Emergency Response)
Bureau of Land Management (BLM) Programs
National Fire Plan
U. S. Department of Transportation Security Administration Freight Rail Security Grant Program
U. S. Department of Transportation Hazardous Materials Emergency Preparedness Grant Program

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Local Ordinances and Regulations

Local ordinances and regulations which affect or promote disaster mitigation, preparedness, response or recovery for the City of Emeryville are listed below.

Local Ordinances and Other Regulations	
Seismic Hazard Mitigation Ordinance	Emeryville's seismic hazard mitigation ordinance was passed in 1995 to amend and clarify an earlier ordinance passed in 1990. This ordinance applies only to unreinforced masonry buildings identified as potential seismic hazards. The mitigation measures contained in this ordinance are minimum measures only and cannot be applied to any building that is undergoing a change of occupancy. For unreinforced and under-reinforced buildings requiring building permits and/or undergoing a change of occupancy, the City has adopted Appendix Chapter A1 of the International Existing Building Code (IEBC).
Seismic Hazard Mitigation Ordinance 95-001	An ordinance of the City of Emeryville Amending Chapter 15 of Title 8 of the Emeryville Municipal Code to clarify and strengthen the seismic hazard identification and mitigation program for unreinforced masonry buildings.
Municipal Code, Title 8, Chapter 15	The purpose of this chapter is to promote public safety by identifying those buildings in Emeryville which are most susceptible to earthquake damage and to require certain mitigation measures to protect the lives of persons working and residing in Emeryville.
Municipal Code, Title 4, Public Safety, Chapter 2: Emergency Plans	The declared purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within the City in the event of a disaster and to provide for the coordination of the civil defense and disaster functions of the City with all other public agencies and affected private persons, corporations and organizations. Any expenditure made in connection with such civil defense and disaster activities, including mutual aid activities, shall be deemed conclusively to be for the direct protection and benefit of the inhabitants and property of the City.
Municipal Code, Title 9, Planning and Zoning, Article 7, Section 9-3.703	The purpose of these regulations is to establish the criteria for the conversion of existing rental units to condominiums while ensuring that converted dwellings meet safety standards related to seismic retrofits and fire codes.
Municipal Code, Title 9, Planning and Zoning, Article 82, Section 9-4.82.16	Hazardous Waste Facility Siting Requirements and Permitting Conditions. Hazardous Waste Facility Projects may not be located within 200 feet of any active or recently active seismic fault; in an area with 25% or greater slope; or areas subject to liquefaction or subsidence unless the facility incorporates adequate engineered designed features which assure structural stability; in an area of highly permeable soils or sediment; in a 100-year floodplain or an area subject to flooding by dam failure or tsunami.
Public Resource Code (PRC) 4251 - 4290	Fire Safe Regulations. These regulations have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction and development in State Responsibility Areas (SRA). The future design and construction of structures, subdivisions and developments in SRAs shall provide for basic emergency access and perimeter wildfire protection measures as specified in PRC 4290.

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Local Ordinances and Other Regulations	
Public Resource Code Section 4291	PRC 4291 is the law requiring annual defensible space be provided around all structures in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material.
Public Resources Code, Title 14	These regulations provide additional fire prevention and suppression standards.
Public Resources Code Section 2694	PRC 2694 states that a person who is acting as an agent for a transferor of real property that is located within a seismic hazard zone, shall disclose to any prospective transferee the fact that the property is located within a seismic hazard zone.
Public Resources Code Section 2695(a)	Development in a liquefaction hazard zone requires adherence to the guidelines for evaluating and mitigating seismic hazards.
Uniform Fire Code	This Code may be adopted by local jurisdictions, with amendments, and provides minimum standards for many aspects of fire prevention and suppression activities. These standards include provisions for access, water supply, fire protection systems, industrial and commercial practices, and the use of fire resistant building materials. The Fire Marshal is authorized to inspect, or cause to be inspected, all building occupancies within the jurisdiction, except for the private spaces of residential dwellings, for the purpose of ensuring compliance with the Uniform Fire Code.
California Fire Code	The California Fire Code is the Uniform Fire Code (see above) with State of California amendments. It is located in Part 9 of Title 24 of the California Code of Regulations. The California Fire Code is revised and published every three years by the California Building Standards Commission. Local jurisdictions have 180 days to make more restrictive amendments to the Code after it is released.
California Health and Safety Code; International Building Code amended by the State as the California Building Code	The Health and Safety Code provides regulation pertaining to the abatement of fire related hazards. It also requires that local jurisdictions enforce the California Building Code, which provides standards for fire resistive building and roofing materials, and other fire-related construction methods.
California Building Code Section Appendix Chapter 1, Administration 106.3.3	The Chief Building Official is authorized to issue a permit for the construction of foundations or any other part of a building or structure before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. Minimum requirements that must be fulfilled before a partial permit may be issued include: all land use, site development, foundation and special inspection issues shall have been resolved and a preliminary review has been completed; if applicable to the project the Public Works Department shall have approved all site drainage and public works improvements including all applicable fees, encroachment permits, bonds, etc.; the Fire Marshal shall have approved all site development features such as access, fire hydrants, etc.; applicable soils reports, special inspection program form, calculations, hazardous materials

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Local Ordinances and Other Regulations	
	management plan and other information deemed by the Chief Building Official to be pertinent and necessary for the performance and inspection of the work.
Uniform Plumbing Code; Mechanical Code; National Electrical Code; International Existing Building Code (Appendix A1)	These codes regulate components and/or features in the building infrastructure for existing and new buildings. The codes are designed to ensure structural integrity during seismic and other hazardous events to prevent personal injury, loss of life and substantial property damage.
California Code of Regulations, Title 19	These regulations pertain to fire prevention and engineering measures for new construction.
California Code of Regulations, Title 14, Article 10	Seismic Hazards Mapping. These regulations shall govern the exercise of city, county and state agency responsibilities to identify and map seismic hazard zones and to mitigate seismic hazards to protect public health and safety in accordance with the provisions of Public Resources Code, Section 2690 et seq.
Earthquake Safety and Public Buildings Rehabilitation Bond Act (Proposition 122)	In 1990, the State of California passed the Earthquake Safety and Public Buildings Rehabilitation Bond Act (Proposition 122). Up to \$50 million was allocated for the seismic retrofit of essential services facilities. Many local governments and special districts have retrofitted their essential services buildings with local funds.
Assembly Bill 337 (Bates Bill)	This Bill was passed in 1992 in response to the Oakland Hills, California fire of 1991. It requires brush clearance and fire resistant roof material (Class A or B) to be used on all new construction that is located in areas designated as being in a "Very High Fire Severity Zone."
California Civil Code 1103	This article mandates three natural hazard disclosures and consolidates these and previously required disclosures onto a statutory form called the Natural Hazard Disclosure Statement (NHDS). This form is now a legally required part of most residential property transactions.
Alquist-Priolo Earthquake Fault Zoning Act	The Alquist-Priolo Earthquake Fault Zoning Act requires the State Geologist to identify earthquake fault zones along traces of both recently and potentially active major faults. The Alquist-Priolo Zones are usually one-quarter mile or less in width and proposed development plans within these fault zones must be accompanied by a geotechnical report prepared by a geologist describing the likelihood of surface rupture and other seismically induced hazards.
California Environmental Quality Act (CEQA) and Guidelines	The CEQA was adopted by the State Legislature to provide public disclosure of the substantial adverse environmental effects of proposed development within the State. The CEQA Statutes and Guidelines (California Code of Regulations Title 14, Chapter 3, Section 15000, et seq.) includes the disclosure of and mitigation for safety hazards as environmental impacts.
Cobey-Alquist Floodplain Management Act	The Cobey-Alquist Floodplain Management Act encourages local governments to plan, adopt and enforce land use regulations for floodplain management in order to protect people and property from flooding hazards. This Act also identifies requirements which jurisdictions must meet in order to receive state and financial assistance for flood control.

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Mitigation Projects and Programs

The following table describes the City's in-progress, ongoing and completed mitigation projects and programs.

In-progress/On-going/Completed Mitigation Projects and Programs		
Program or Project	Status	Description
Local Hazard Mitigation Plan	In-Progress	Local Hazard Mitigation Plan for the City of Emeryville. The overall intent of this Plan is to reduce or prevent injury, death and damage from hazards in the City. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. This Plan also guides hazard mitigation activities by establishing hazard mitigation goals and objectives.
Update General Plan	In progress	The City of Emeryville is in the process of updating their current General Plan which includes the Safety Element.
Emeryville Planning and Building Design Criteria	Completed	The following design criteria is applicable to all Emeryville building projects: <ol style="list-style-type: none"> 1. Wind zone: 85mph 2. Wind exposure "B" - East of the freeway 3. Wind exposure "C" - West of the freeway 4. Seismic Loads - ASCE-7-05 5. Rain intensity: 3 in./hour 6. 2007 California Codes <p>The City of Emeryville lies between 2 km-10 km from the Hayward fault. Projects in the City will be significantly affected by seismic events.</p>
Program for Seismic Retrofit for Wood-Framed Dwellings	Completed	The City of Emeryville has established a program to encourage owners of one and two-family, wood-framed residential structures to seismically upgrade their properties. Emeryville property owners may purchase, from the Emeryville Building Division, a pamphlet and a drawing that will help them to install simple seismic retrofit measures to their buildings. This drawing may be used by a licensed contractor or by a skilled homeowner who wishes to take out an owner/builder permit. The permit applicant needs to provide a basic foundation plan of the structure to be retrofitted.
Fire Prevention Education Program	Ongoing	This program encompasses a public information and education component that promotes public awareness of the significance of Fire/Safety prevention measures. This program enables the public to be better prepared when an emergency fire situation occurs.
Community Emergency Response Team (CERT) Program	Ongoing	This program provides instruction to and assists in the organization of citizens within the community to respond to and become more self-sufficient after a widespread disaster event.

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In-progress/On-going/Completed Mitigation Projects and Programs		
Program or Project	Status	Description
Groundwater Management Plan	Completed	Emeryville’s Groundwater Management Plan (GMP) is designed to protect public health, deep groundwater resources, and ecological resources of the San Francisco Bay while providing regulatory relief and more cost certainty for property owners and developers.
CIERRA Cleanup Loan Program	Ongoing	<p>CIERRA loan funds can only be used to remove contaminants from the soil and groundwater. The activities listed below are permitted.</p> <ul style="list-style-type: none"> • Removal of hazardous materials from sites during remediation and construction; • Containment, capping, stabilization and drainage control; • Public participation requirements; • Providing alternative water sources during removal; • Demolition that is part of removal; and • Regulatory Agency oversight activities.

Land Use and Development Trends

Emeryville’s land use transformation over the past 20 years has been extensive. Formerly dominated by manufacturing and distribution, the City is now marked by ever increasing development of office, regional retail, and high-density residential land uses, as well as mixed-use developments. Because Emeryville is a built out city, new development will result from reuse of existing underutilized sites and redeveloping its existing land uses or rehabilitating older buildings.

Emeryville’s Zoning Ordinance contains nine base land use districts, including two residential districts. Unlike in most traditional zoning ordinances, the City maintains a map-based system of building intensity (floor-to-area ratio) and building height regulations. This system—where building heights and FARs are not linked to a underlying land uses—is an excellent approach for a city of Emeryville’s size, allowing molding of urban form based on geographic and location considerations. Thus, the City’s zoning regulations—which regulate what gets built on the ground—reflect a more intense, mixed, and in some instances a taller city than suggested by a simple reading of the General Plan. Consequently, the Emeryville emerging from the zoning ordinance is somewhat incremental and project specific rather than reflecting a broad vision for the community. Furthermore, allowing residential uses virtually everywhere does not reflect the intent of the current General Plan and is resulting in issues such as the development of neighborhoods without access to everyday amenities, such as stores, schools, and parks.

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Overall Pattern

Previously an industrial town, the City is no longer dominated by a single land use. Around half of the developable land (excluding roads, highways, and other rights of way) is in Commercial (36%) or Industrial (14%) use and just under a quarter (21%) is used for housing. The remaining quarter of the City is in Public use (7%), Parks and Open Space (7%), or a mix of uses (8%). Around 7% of the land is vacant unassigned.

Almost all of the Bayfront and freeway edge area west of the railroad tracks has been redeveloped in the past 30 years. Much of this space is devoted to retail and office uses in large-scale developments, such as Bay Street, IKEA, the Marketplace, and Powell Street Plaza which serves a regional clientele. Almost no industrial uses remain in this area and most of the remaining industrial parcels are likely to be changed into new uses in the future. Residential developments to the west of the tracks (Watergate Condominiums, Pacific Park Plaza, and Archstone/Bridgewater (formerly EmeryBay Club and Apartments) are few in number, but large in size and high in density, comprising around 2,750 housing units—half of the housing in the City.

The following table shows the specific acreages for each land use.

EMERYVILLE LAND USE DISTRIBUTION (IN ACRES)		
Land Use (2005)	Acres	% of Total
Commercial	222.0	36%
Residential	126.2	21%
Industrial	87.5	14%
Mixed Use	48.0	8%
Public	45.7	7%
Parks and Open Space	44.7	7%
Vacant / Unassigned	40.8	7%
TOTAL		100%

Source: Emeryville General Plan

Because Emeryville is largely flat, topography does not play a factor in the City’s land use pattern. Transportation corridors, however, do split the City into several sub-districts. The main divisions are I-80 and the railroad, and to a smaller extent Powell Street. I-580 separates Emeryville from Oakland along the southern City limits, although a portion of the area north of I-580 is in Oakland.

Following are Emeryville’s existing land use map and a land use diagram which designates the proposed location, distribution, and extend of activities that may take place throughout the City.

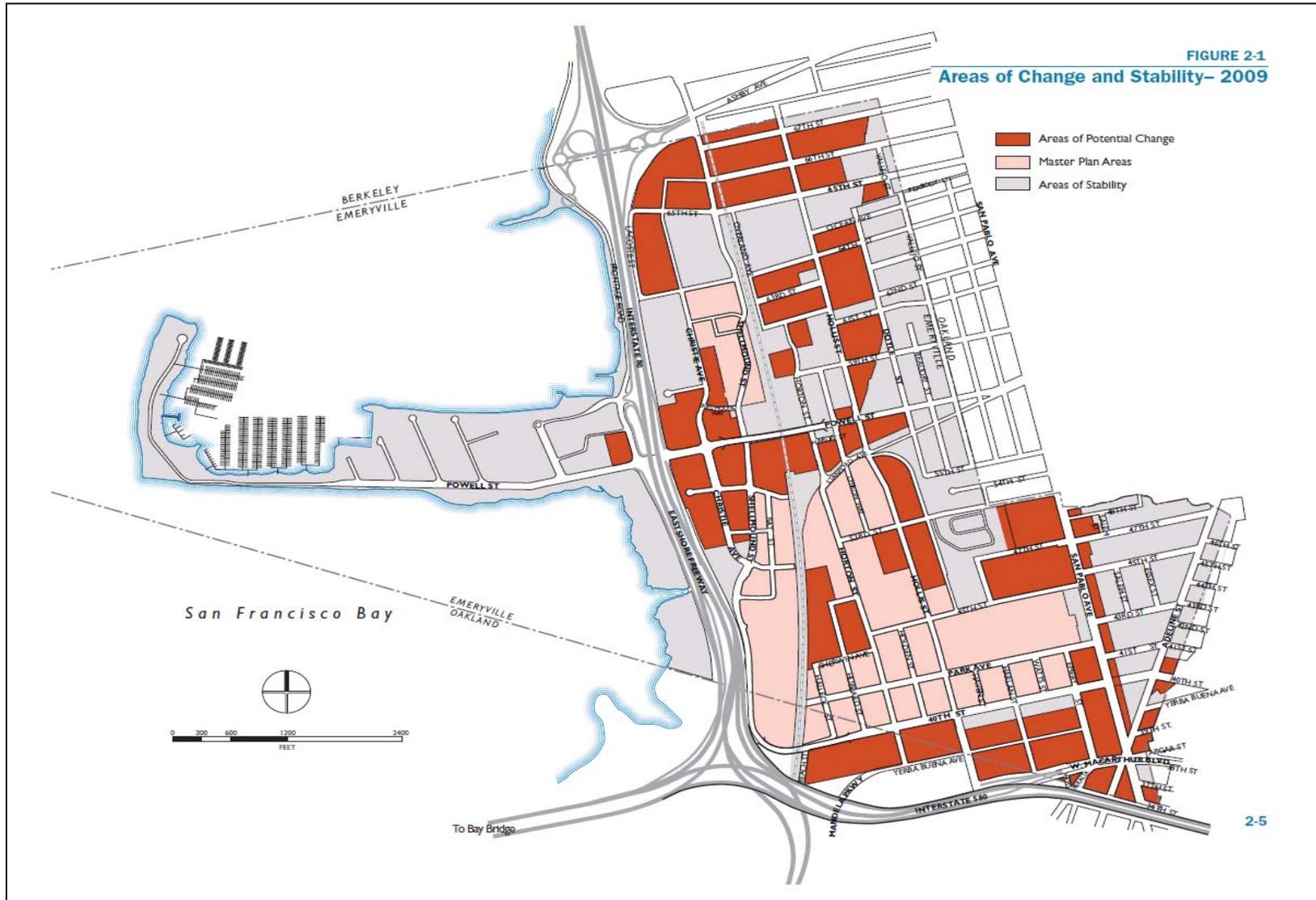
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Land Use Goals and Policies

Following are Emeryville's land use goals and policies:

Goals:

- LU-G-1: An overall balance of uses. Employment, residential, cultural, destination and local retail – as well as a full range of amenities and services necessary to support a vibrant community.
- LU-G-2: A mixed use city. Mixed-use development in various parts of the city, with the range of permitted and required uses varying to meet the needs of specific districts and neighborhoods.
- LU-G-3: Community activity centers. Centers that combine residential, retail, office, and public uses to create areas of identity and activity for residents and visitors.
- LU-G-4: A mix of housing types. A diversity of housing types to accommodate a variety of household sizes and incomes.
- LU-G-5: Preservation of residential neighborhoods. Residential use, structures, low-rise scale, and character of the Triangle, Doyle Street, and Watergate neighborhoods preserved, and the scale of other areas of stability maintained.
- LU-G-6: Vibrant new mixed-use centers. Intensification of existing underutilized commercial centers with surface parking (such as Powell Street Plaza and East Bay Bridge Center) as vibrant, multi-story, walkable mixed-use destinations with structured parking and open space.

Policies:

- LU-P-1: Land uses will be consistent with the Land Use Classifications and the Land Use Diagram.
- LU-P-2: The Powell/Christie/Shellmound/I-80 interchange area will be developed into a compact but high-intensity regional transit hub. This hub will include a retail core, with stores, restaurants, and hotels; a financial and commercial center, creating a daytime work population; and a residential neighborhood, providing vitality during non-work hours.
- LU-P-3: The northern (north of Powell) and southern halves of the Powell/Christie core area shall be integrated and connected, and the district shall be walkable, with small blocks, pedestrian-oriented streets, and connections to surroundings.
- LU-P-4: Park Avenue (west of Hollis Street), Hollis Street (between 61st and 67th streets), Powell Street/Captain Drive, and San Pablo Avenue (between 36th and 47th streets) will be developed as walkable, mixed-use neighborhood centers, with an array of amenities and services – including stores, restaurants and cafes,

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galleries, and office uses – to serve neighborhood needs, with community-serving uses and active building frontages that engage pedestrians at the ground level.

- LU-P-5: Retail uses will be concentrated in areas with Neighborhood or Regional Retail overlays, near neighborhood centers, and in the Emeryville Marketplace.
- LU-P-6: The current deficiency of park and open space will be addressed by making parkland acquisition a high priority by the city, and working with private land owners to secure these areas through development incentives, land swaps, and other mechanisms.
- LU-P-7: Existing uses on sites designated for two large community parks along Hollis Street shall remain as conforming uses, until such time as these sites are acquired by or dedicated to the city.
- LU-P-8: Live/work uses will be permitted in all land use designations except Office/Technology, Public, Parks/Open Space, and Marina. In the Industrial district well of Hollis Street, only “heavy” live/work-involving, for example, manufacturing, welding, or assembly will be permitted.

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4. Hazards Facing the City of Emeryville

Identification of Hazards

With its rapidly growing permanent, transient, and recreational populations, Emeryville is subject to potential negative impacts from a broad range of hazards and threats. There are three broad categories of hazards that threaten the City, namely:

- Natural hazards
- Technological hazards
- Domestic security threats

Natural hazards include:

- Earthquakes (ground movement/liquefaction/tsunami)
- Floods
- Wildfire
- Extreme Weather (windstorms/tornados/drought)
- Naturally Occurring Biological Threats

Technological hazards include:

- Hazardous Materials (Hazmat) Incidents

Domestic security threats include:

- Terrorism (CBRNE)
 - Chemical
 - Biological
 - Radiological
 - Nuclear
 - Explosive

The following table describes how and why the hazards listed above were identified by the City of Emeryville in preparing its LHMP.

Hazard	How and Why Identified
Earthquakes	History of events; presence of fault lines
Flooding	History of events
Wildfire	History of events
Extreme Weather	History of events
Hazardous Materials	History of events
Naturally Occurring Biological Threats	History of events
Terrorism	History of events; heightened sense of awareness since September 2001

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In the following section are the identified hazards faced by the City of Emeryville as identified by the Hazard Mitigation Working Group. The hazards also indicate the risk probability and severity assessment identified by the Hazard Mitigation Working Group as related to the City.

For the rating of “**probability**” of occurrence, for each of the following hazards, the participants in the workshop were asked to provide ratings of the likelihood that an event would occur in the future. The ratings that were used were:

- High Probability (highly likely to occur)
- Medium Probability (likely to occur)
- Low Probability (not very likely to occur)

These were subjective, order-of-magnitude ratings that participants could relate to whether they were highly skilled in a hazards area (e.g., members of a fire department) or not. This approach facilitated utilizing a consensus approach with the participating group.

For the rating of “**severity**”, the participants in the workshop were asked to provide ratings of the likely severity of an event, assuming one occurred in the future. The ratings that were used were:

- High Severity (extensive loss of life and/or property)
- Medium Severity (moderate loss of life and/or property)
- Low Severity (relatively modest loss of life and/or property)

These were subjective, order-of-magnitude ratings that participants could relate to whether they were highly skilled in a hazards area (e.g., members of a fire department) or not. This approach facilitated utilizing a consensus approach with the participating group.

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4.1 Hazard: Earthquakes

Earthquake risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to Emeryville.

Probability: High	Severity: High
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Hazard Definition

An earthquake is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual; at other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

The major form of direct damage from most earthquakes is damage to construction. Bridges are particularly vulnerable to collapse and dam failure may generate major downstream flooding. Buildings vary in susceptibility, dependent upon construction and the types of soils on which they are built. Earthquakes destroy power and telephone lines; gas, sewer, or water mains; which, in turn, may set off fires and/or hinder firefighting or rescue efforts. The hazards of earthquakes varies from place to place, dependent upon the regional and local geology. Ground shaking may occur in areas 65 miles or more from the epicenter (the point on the ground surface above the focus). Ground shaking can change the mechanical properties of some fine grained, saturated soils, whereupon they liquefy and act as a fluid (liquefaction).

Liquefaction is a transformation of soil from a solid to a liquefied state, resulting from the buildup of excess pore water pressure, especially during earthquake-induced cyclic loading. Soil susceptible to liquefaction includes loose to medium dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Liquefaction and associated failures could damage foundations, disrupt utility service, and cause damage to roadways.

Where earthquakes have struck before, they will strike again. Earthquakes can strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night.

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a

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result of the ground shaking, or people trying to move more than a few feet during the shaking. Much of the damage in earthquakes is predictable and preventable.

Existing Faults in Emeryville

The San Francisco Bay Area is a seismically active region with numerous active faults. Although no active faults run through Emeryville, the City is approximately three miles from the Hayward Fault and 15 miles from the San Andreas Fault, the two most prominent and active faults in the Bay Area. Therefore, the entire City is subject to hazardous ground shaking in a major earthquake.

The **Hayward Fault Zone** is a geologic fault zone capable of generating significantly destructive earthquakes. The Hayward Fault forms part of what scientists refer to as the San Andreas system, and it runs for 60 miles along the hills of the East Bay, cutting through the University of California Berkeley football stadium and skimming uncomfortably close to the Caldecott Tunnel, through which 153,000 cars pass daily. Major highways, including Interstate 80, cross the Hayward Fault, as do the pipelines that bring water down from the snow-clad Sierra. There are hundreds of privately owned structures in the fault zone, virtually all built before the State passed a tough earthquake-zoning law in 1972.

Since 1868, however, the Hayward Fault has been relatively quiet, and has not generated a large earthquake. The forces that lead to earthquakes have not stopped, though. The rocks underlying San Francisco Bay continue to move northwest with respect to those east of the Hayward Fault, but most of the fault zone itself is stuck, and pressure is slowly building up in the rocks near the fault zone. Eventually the pressure will overcome the friction and other forces that are causing the fault zone to stick and the accumulated energy will be released in another big earthquake.

While almost all of the fault zone is stuck, in some places conditions within the rock allow the portion of the fault at the surface to slowly slide along in response to the pressure building up on the stuck fault. This slow sliding is called fault creep. Although the motion of creep is very slow (on the Hayward Fault, the maximum creep rate is 9 mm/year, or about 1/1000 mm/hour), over the years the effects of the offset can be seen, especially in manmade structures. It is important to note that while creep does allow that part of the fault near the surface to slide along without pressure building up, most of the fault at depth is still stuck, so creep doesn't do much to help reduce the next big earthquake. However, creep does help find some of the parts of the fault zone where pressure is building up.

The Hayward Fault continues north under the eastern margin of Lake Temescal and its dam, which is unlikely to fail since it has been completely reinforced by the extensive earth fill supporting Highway 24.

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Lake Temescal (shown in the photo at left) began its historical existence as a sag pond—a place where two fault strands allow the rocks between them to sink. The early Anglo settlers dammed it to hold more water for the growing town, but for many years it has been left alone as the city secured better water elsewhere. The lake is now a park, including a fault exhibit and a short stretch of rare undisturbed creek bed.

The Hayward Fault is parallel to its more famous (and much longer) westerly neighbor, the **San Andreas Fault**, which lies offshore and through the San Francisco peninsula. The San Andreas Fault is a geologic transform fault, also known as a “right-slip fault,” that runs a length of roughly 800 miles through California. The term “right-slip” refers to the fact that an observer standing on either side of the fault will, over time, perceive the landforms on the other side of the fault to be moving to the right. While the San Andreas Fault is the principal transform boundary between the Pacific Plate and the North American Plate, the Hayward Fault, also a right-slip fault, takes up a share of the overall motion between the plates.

To the east of the Hayward lies the **Calaveras Fault**. It was long believed that there was no connection between the Hayward Fault and the Calaveras Fault. Recent geological studies (particularly the examination of very small and deep earthquakes) suggest that the two faults may be connected. If true, this would have significant implications for the potential maximum strength of earthquakes on the Hayward Fault, since this strength is determined by the maximum length of the fault rupture and this rupture could extend beyond the juncture point and so include some portion of the Calaveras Fault.

North of San Pablo Bay, and somewhat offset from the Hayward Fault is the **Rodgers Creek Fault**, considered by many experts to be an extension of the Hayward Fault. However, the connection between the two faults is still unclear as they are not aligned under San Pablo Bay. In fact, the Rodgers Creek Fault is actually aligned with the Pinole Valley Fault, not the Hayward Fault. Nonetheless, the current view is that the Hayward Fault and Rodgers Creek Fault are probably connected by a series of fault strands beneath San Pablo Bay. It is considered possible that a major seismic event on either fault may involve movement on the other, either concurrently or within a short interval of up to several months. The Rodgers Creek Fault is regarded as one of the most hazardous faults in northern California and is believed to be entirely locked (i.e., no recognized creep) and has not had a major historical earthquake. Another fault further north, the **Maacama Fault**, is also considered to be part of the Hayward Fault subsystem.

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The entire City lies within a liquefaction hazard zone which presents constraints on development. The Peninsula has a very high susceptibility to liquefaction, while the areas around the rail line and east have a moderate to low risk of liquefaction.

Excessive soil erosion can eventually lead to the damage of building foundations, roadways, and loss of topsoil. Throughout Emeryville, areas that are most susceptible to erosion are those that would be exposed during the construction phase and along the shoreline where soil is subjected to wave action. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures, asphalt, slope protection, or vegetation.

Deep alluvium and bay mud deposits can intensify groundshaking through wave amplification and longer durations of shaking. The most recent United States Geological Survey (USGS) assessment of earthquake probabilities from 2002 gives a 62 percent probability of a magnitude 6.7 or greater earthquake somewhere in the Bay Area before 2032.¹ Together, the Hayward Fault and the Rodgers Creek Fault account for 27 percent of that probability, more than any other fault in the area, including the San Andreas, which has a 21 percent chance.

History

Emeryville lies at the eastern edge of the San Francisco Bay in part of the flatlands which is also referred to as the East Bay Plain. The East Bay Plain consists of alluvial deposits that originated from the Berkeley Hills. The western side of the City contains former tidal sloughs and marshlands that were progressively filled in dating back to the 1900s. The City is essentially flat with many areas on the margin of the Bay located on artificial fill. Where not covered by fill, the City's surface soils consist predominantly of fine-grained alluvium, including silts and clays. Toward the western portion of the City the alluvium is underlain by bay mud—a natural marine deposit that consists of soft saturated clays that can contain lenses of sand and shell fragments. Development on artificial fill placed over bay mud often presents unique geotechnical engineering challenges because, unless the fill is properly engineered, structures can be damaged by differential settlement and subsidence. Under the bearing load of a new structure, bay mud tends to go through a cycle of consolidation that can lead to settlement.

Excessive soil erosion can eventually lead to damage of building foundations, roadways, and loss of topsoil. Throughout Emeryville, areas that are most susceptible to erosion are those that would be exposed during construction phase and along the shoreline where soil is subjected to wave action. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures, asphalt, slope protection, or vegetation.

¹ United States Geological Survey. "Earthquake Probabilities in the San Francisco Bay Region: 2002–2031" 2003: ES1.

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On October 30, 2007 at around 8:00 p.m. local time, a magnitude 5.6 struck the adjacent Calaveras Fault near San Jose, close to where the Hayward Fault diverges from it. The effects of an earthquake of this size include the spilling of merchandise from store shelves but little structural damage. An earthquake of this size can be locally terrifying, however, and this particular event was also widely felt through Northern California and as far north as Oregon owing to the time of day, when most people were awake and sitting quietly in their homes. Minor aftershocks have continued through the spring of 2008.

During 2007, a number of small earthquakes occurred on the northern segment of the Hayward Fault from Oakland to Berkeley.

The Loma Prieta Earthquake of October 17, 1989 occurred at 5:04 p.m. when a segment of the San Andreas Fault in the mountains northeast of Santa Cruz, California, ruptured over a length of approximately 28 miles. The Seismographic Station at the University of California, Berkeley determined the earthquake had a magnitude of 7.1 on the Richter scale and lasted for 15 seconds. The earthquake occurred when the crustal rocks comprising the Pacific and North American Plates abruptly slipped as much as two meters (seven feet) along their common boundary - the San Andreas Fault system. While damage from the Loma Prieta Earthquake was severe in counties near the epicenter, more than 80 percent of the fatalities (50 out of 63 deaths) and 70 percent of the \$6 billion in monetary losses occurred in San Francisco and Alameda Counties, approximately 50 miles from the epicenter.

Some of the most vivid and widely publicized examples of damage were the collapsed section of the Interstate 880 Cypress Street Viaduct in Oakland, located a few blocks to the south of the City of Emeryville; the partial collapse of a section of the San Francisco-Oakland Bay Bridge; and the structural failures and fires in the Marina District of San Francisco.

Following are photos from the USGS of the collapsed section of the Cypress structure, the freeway approach to the Bay Bridge from Oakland, which collapsed during the Loma Prieta earthquake, killing 42 people. Soft muds on which it was constructed shook much more strongly than surrounding regions on stronger ground.

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The 1906 San Francisco Earthquake and Fire have endured as one of the most widely known disasters in the world. Almost 300 miles of the San Andreas Fault ruptured shortly after 5:00 a.m. on April 18, 1906, affecting portions of 19 California counties, from Mendocino in the north to Sacramento in the east and Monterey in the south. The ground shaking and ensuing fires caused more than 3,000 deaths, destroyed over 28,000 buildings, and left homeless about 225,000 of Northern California's one million residents.

Of all the region's large faults, the Hayward-Rodgers Creek fault system is considered most likely to create the next major destructive earthquake in the near future. Less destructive earthquakes have been occurring in the region at random 15 to 30 year intervals - typically causing spillage of merchandise and occasionally, structural failures in lower stories and chimneys. This type of event is considered *normal* in California's "Earthquake Country" by geologists and long term natives, although disquieting to recent immigrants to the region.

The most recent USGS assessment of earthquake probabilities from 2002 gives a 62 percent chance of a magnitude 6.7 or greater quake somewhere in the Bay Area in the next 30 years. Together, the Hayward Fault and the Rodgers Creek Fault account for 27 percent of that probability, more than any other fault in the area, including the San Andreas, which has a 21 percent chance. Recent (January 2008) assessments suggest that the Hayward, Rodgers Creek, and Calaveras faults may be more likely to fail in the next few decades than previously thought.

Following is a list of historical earthquakes (3.5M or larger) occurring within 20 miles of the City of Emeryville.

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Date	Mag.	Location Felt/Origin	Damage/Injuries/Death
09/05/2008	4.0	East Bay	The earthquake just after 9:00 p.m. was centered two miles east northeast from Alamo and four miles north northwest of Danville.
06/03/2008	3.9	Bay Area	3.9 earthquake strikes north of Vallejo. The earthquake hit just before 7:30 p.m. at a depth of 10.8 miles.
10/30/2007	5.6	Bay Area	Earthquake hit at approximately 8:04 p.m. and was felt widely throughout the Bay Area. The epicenter was in the foothills east of San Jose; Fire Departments had responded to several calls about broken pipes and potential flooding.
07/20/2007	4.2	East Oakland	An earthquake with an epicenter about two miles east-northeast of Oakland shook the entire Bay Area for anywhere from 10 to 20 seconds. The earthquake struck at 4:42 a.m. and was centered close to the Hayward Fault.
03/02/2007	4.2	Lafayette	4.2 earthquake rocks Bay Area.
12/23/2006	3.5	Berkeley	3 rd earthquake in four days rattles East Bay. The temblor struck at 9:21 a.m. and had a preliminary magnitude of 3.5 and a depth of about 6.1 miles.
12/22/2006	3.7	Berkeley	The 3.7 earthquake was felt across the Bay Area. The earthquake struck at 10:49 p.m. and centered in the Berkeley Hills on the Hayward fault.
12/20/2006	3.7	Berkeley	The earthquake struck at 7:12 p.m. and was centered about two miles east-southeast of Berkeley.
03/21/2006	3.7	Moraga	A minor earthquake hit at 1:41 p.m. about four miles southeast of Moraga, followed by a series of smaller aftershocks.
09/04/2003	3.9	Piedmont	A 3.9 earthquake sent a sharp, short jolt throughout the area and sent items crashing off shelves and set off warning sirens in neighborhoods around a chevron oil refinery.
02/25/2001	4.4	Bay Area	4.4 earthquake jolts Bay Area
10/17/1989	7.1	Loma Prieta (San Francisco and Monterey Bay regions), San Andreas Fault	The Loma Prieta Earthquake of October 17, 1989 occurred at 5:05 p.m. when a segment of the San Andreas fault in the mountains northeast of Santa Cruz, California ruptured over a length of approximately 28 miles. While damage from the Loma Prieta Earthquake was severe in counties near the epicenter, more than 80 percent of the fatalities (50 out of 62 deaths) and 70 percent of the \$6 billion in monetary losses occurred in San Francisco and Alameda Counties, approximately 50 miles from the epicenter.
04/18/1906	7.8	San Andreas Fault	The great San Francisco earthquake resulted from rupture of the San Andreas fault from the Monterey-San Benito County line to the Humboldt-Mendocino County line. This rupture overlapped the 1838 rupture from San Juan Bautista to San Francisco. Significant damage occurred from northern Monterey County to southern Humboldt County, and as far inland as Napa, causing ~3,000 deaths and \$524 million in property loss, counting fire damage. The upper part of the Emeryville town, which was nearly completed, experienced damage: plastering was knocked down; one of the large columns in the front was broken; and the smokestack had its upper third thrown off.
06/02/1899	5.6	San Francisco Area	This 5.6 magnitude earthquake was felt in Berkeley and Oakland. Many people were badly scared; people ran out of buildings/residences; two chimneys toppled over. No reported injuries.

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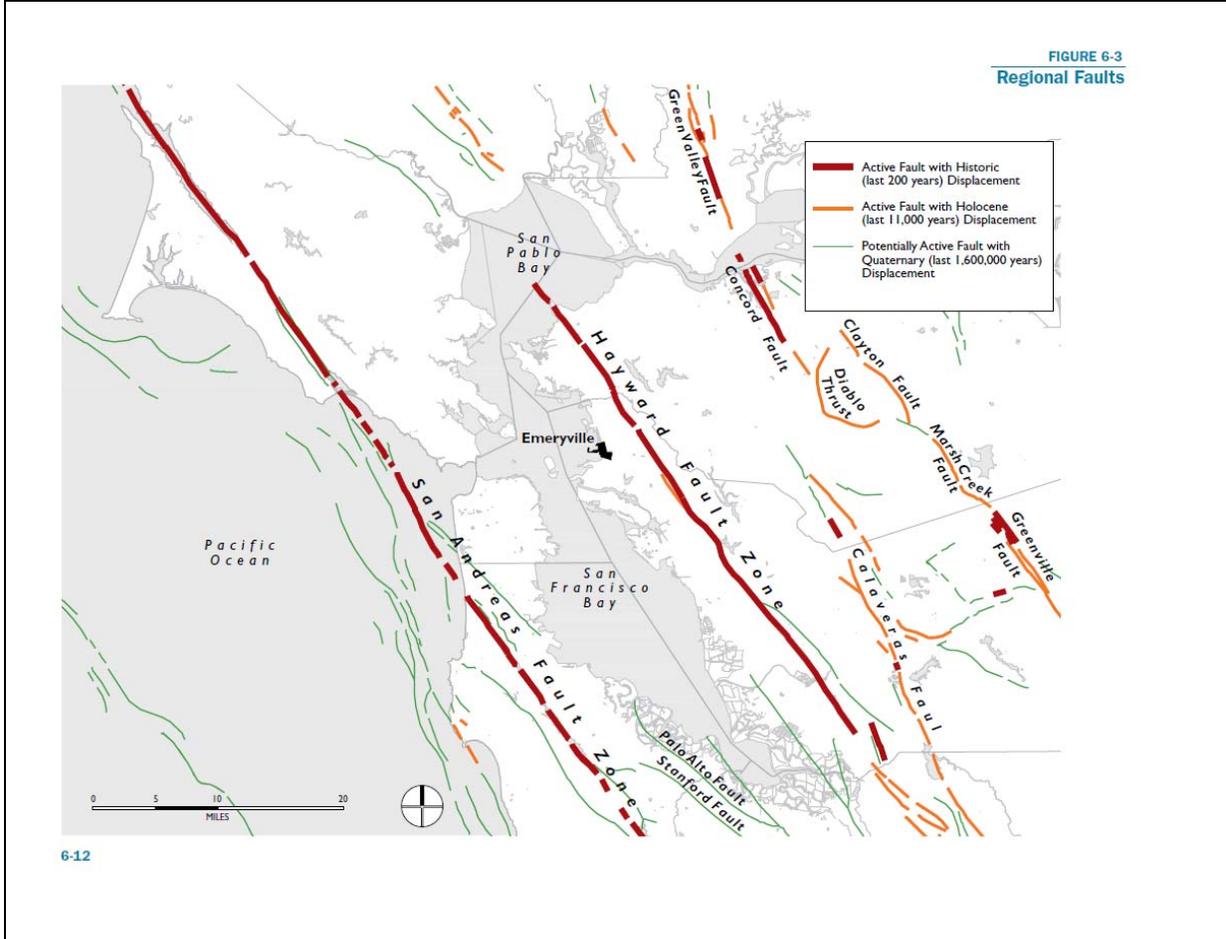
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Date	Mag.	Location Felt/Origin	Damage/Injuries/Death
07/31/1889	5.6	Hayward Fault, Alameda County	Emeryville experienced several broken mirrors attached to bureaus in a furniture company; there were cracked windows in Berkeley; and windows rattled; people awakened, walls cracked. No reported injuries.
04/02/1870	5.8	Hayward Fault, Contra Costa County	Oakland / Alameda County reported damages consisting of cracked ceilings; knocked crockery and glassware from shelves; plaster tumbled from ceilings; windows and looking-glasses smashed; medicines tumble from shelves in drug stores. No reported injuries.
10/21/1868	7.0	Hayward Fault, Alameda County	This major Hayward fault earthquake was the strongest event in the Bay area since the major 1838 San Andreas fault earthquake. It was also named “the great San Francisco earthquake” because in 1868 San Francisco suffered much of the damage. This earthquake caused 30 deaths and \$350,000 in property loss.
05/21/1864	5.8	South Hayward	No additional information available.

The following maps depict the locations of known faults lines, geology and earthquake shaking potential, and liquefaction susceptibility, in Emeryville.

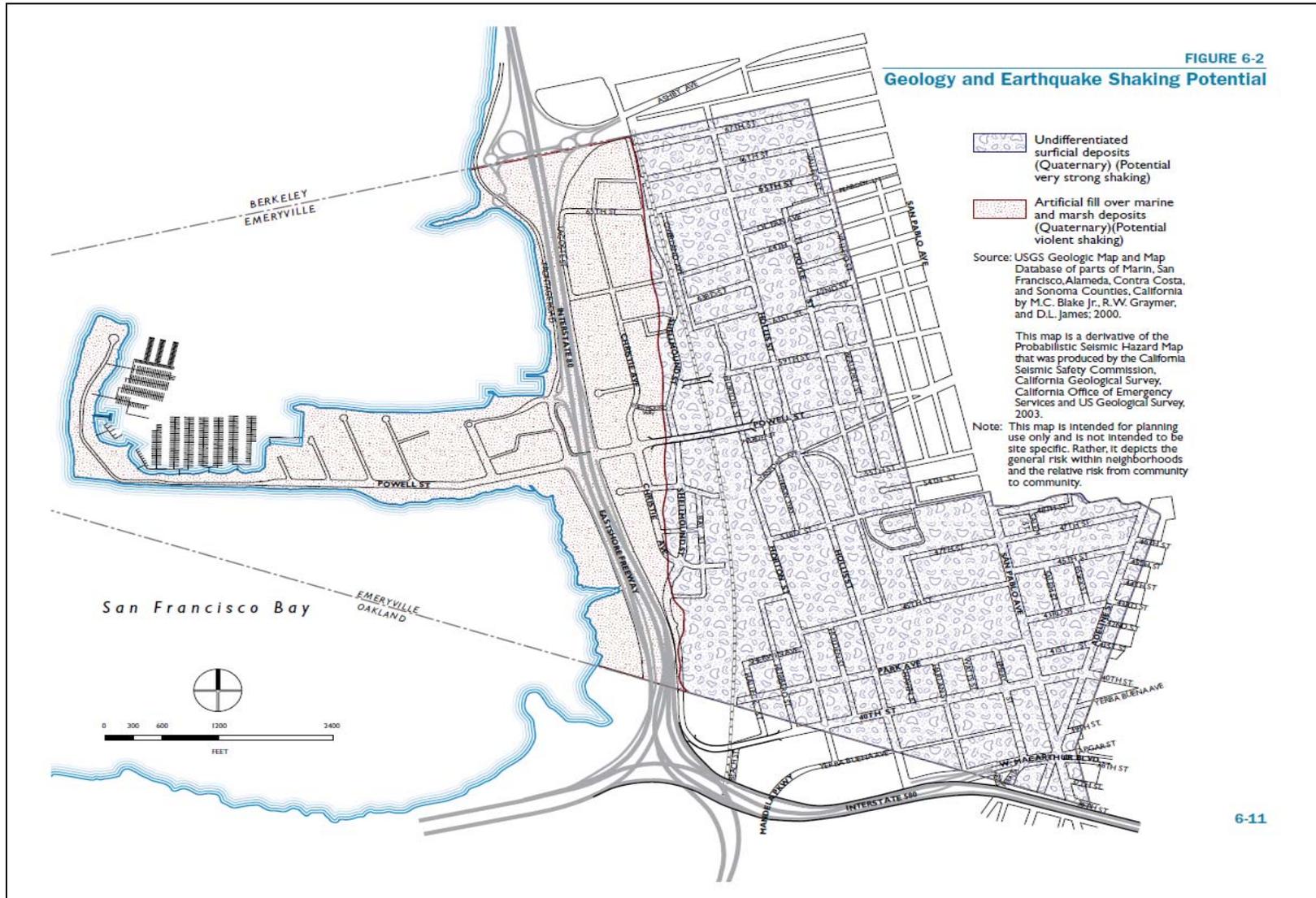
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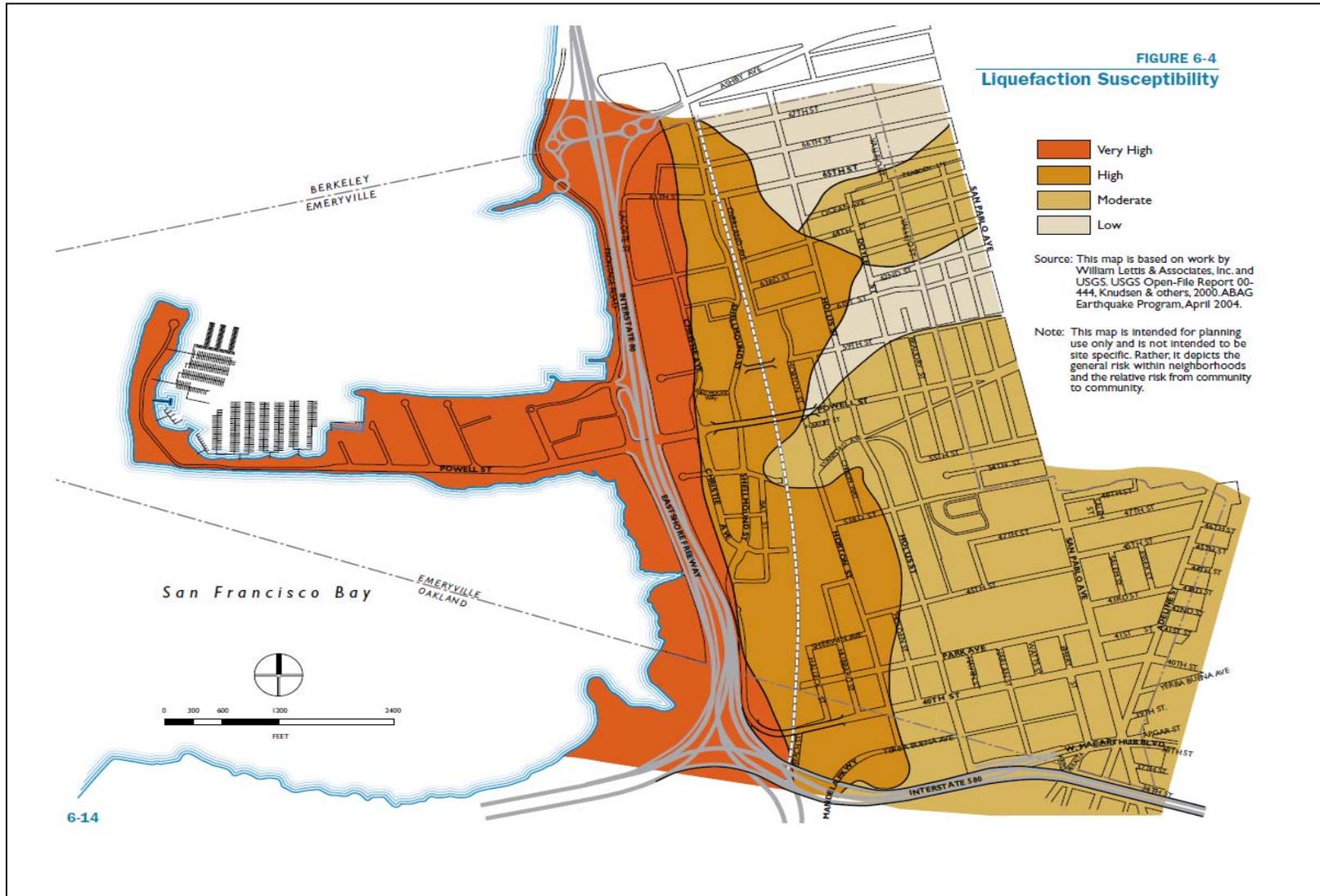
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Risk Assessment

Earthquakes are the principal geologic activity affecting public safety in Emeryville. In the event of an earthquake, the location of the epicenter as well as the time of day and season of the year would have a profound effect on the number of deaths, casualties, property damage, and disruption of normal government and community services and activities. The effects could be aggravated by collateral emergencies such as fires, dam failure, flooding, tsunami, hazardous material spills, utility disruptions, bridge collapses, structural collapses, street blockage by debris, street surface breakage due to liquefaction, landslides and transportation emergencies. The community needs would most likely exceed the response capability of the City's emergency organizations, requiring mutual assistance from volunteer and private agencies, the California Emergency Management Agency and the Federal Emergency Support functions.

- **Effects on people and housing.** In any earthquake, the primary consideration is saving lives. Time and effort must also be dedicated to providing for mental health by reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens.
- **Effects on commercial and industrial structures.** After any earthquake, individuals are likely to lose wages due to the inability of businesses to function because of damaged facilities and/or goods. With business losses, Emeryville will lose revenue. Economic recovery from even a minor earthquake will be critical to the communities involved.
- **Effects on infrastructure.** The damage caused by both ground breaking and ground shaking can lead to the paralysis of the local infrastructure including police, fire, medical and government services. Highways and roads could buckle and pavement surfaces can be made impassable for most vehicles.

Risk assessment conclusion. Earthquake damage to structures can be caused by ground rupture, liquefaction, groundshaking, and possibly inundation from tsunami. The level of damage in Emeryville resulting from an earthquake will depend upon the magnitude of the event, the epicenter distance from the City, the response of geologic materials, and the strength and construction quality of structures.

During an earthquake, shaking of granular loose soil saturated with water can lead to liquefaction. The entire City of Emeryville lies within a liquefaction hazard zone which presents constraints on development. The Peninsula has a very high susceptibility to liquefaction, while the areas around the rail line and east have a moderate to low risk of liquefaction. Development in a liquefaction hazard zone requires adherence to the guidelines

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for evaluating and mitigating seismic hazards as required by Public Resources Code Section 2695(a). Before a development permit can be granted for a site within a Seismic Hazard Zone, (i.e., anywhere in Emeryville), a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. Mitigation of liquefaction hazards can include edge containment structures (e.g., berms, dikes, retaining walls, etc.), driving piles, removal or treatment of liquefiable soils, or modification of site geometry.

The current estimates of the probability of a major earthquake on any of the numerous regional faults range up to 70 percent within the 30 year period 2000 - 2029. A recent *quiet period* following many years of minor activity is considered to be particularly ominous by many, although geologists have not yet been able to predict earthquakes with any useful accuracy. They do warn that all residents of the region should be prepared for a large event and its subsequent effects (e. g., lack of water, firefighting, first aid, electricity, motor and heating fuels, etc.).

Depending upon seasonal weather conditions at the time of a major earthquake event, a seismic event could be followed by huge urban conflagrations compounded by damage to water systems or massive landslides in saturated soils. In addition to direct damage, the effects on commerce due to damaged infrastructure would also be substantial. Experience with large area urban destruction such as caused by earthquake and firestorms has shown that complete rebuilding can take up to a decade, owing to various factors including disputes with insurance companies, a lack of qualified local builders, shortages of supplies, an influx of contractors from outside of the region of dubious qualifications and with no incentive to maintain and enhance a local reputation.

Geographic Areas Affected

The City has examined the earthquake hazard exposure of urban land, infrastructure, critical health care facilities, schools, city-owned buildings and other businesses and has identified that:

- 200 acres are in areas of moderate, high or very high liquefaction susceptibility;
- No roads are in areas of existing landslides;
- Three miles of roadway are in areas of moderate, high, or very high liquefaction susceptibility;
- Six miles of roadway are in the highest two categories of shaking potential;
- No critical health care facilities, schools, or city-owned properties are in areas of existing landslides;
- Some city-owned facilities are located in moderate, high, or very high liquefaction susceptibility: Fire Station #1; Police Station; Ocean View Restaurant; and Marina Services and public building.
- The following buildings/businesses are also located in moderate, high, or very high liquefaction susceptibility areas: a 2500 unit apartment building; five major

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high rise and hotel buildings; major Interstate Freeway system in I-80; and a sewer lifting station.

- All four schools, both Fire Stations, Police Station, City Hall, Veterans Senior Center, and two senior housing facilities are in the highest two categories of shaking potential.

Relationship to Other Hazards – Cascading Effects

Earthquakes occurring in Emeryville are a triggering event which permits the force of gravity to operate and create many secondary hazards from ground shaking, including:

- differential ground settlement, soil liquefaction, rock and mudslides, sink holes and ground lurching;
- ground displacement along the fault;
- floods from dam failure, seiches or tsunamis;
- fires; and
- the various adverse results of disruption of essential facilities and systems such as water, sewer, gas, electricity, transportation, and communication.

Unreinforced Masonry Buildings

Unreinforced masonry structures perform poorly under almost all earthquake conditions, and especially if located on poor ground areas. Nearby relatively small earthquakes can be very damaging because of the sharp motions they generate. Distant events, while more damaging to taller buildings, can also damage unreinforced masonry buildings because of the stresses caused by long-period motions.

Evidence from past earthquakes shows that wood frame structures properly tied to their foundations with reinforced sheer bracing to support their cripple walls perform very well, or if badly damaged cause few injuries and life loss even if located in poor ground areas. Older wood frame structures that have stone, brick, or cripple wall foundations, or that are not bolted to their foundations, do not perform well. Mobile homes generally perform very well because of their lightness, but failures of their weak foundation supports (usually flimsy metal stands or concrete blocks) can produce serious damage and economic losses. Older mobile homes are also considered serious fire hazards because of the non-fire resistant wall paneling and other materials.

Unreinforced masonry buildings can be hazardous to the public during earthquakes. These buildings could collapse due to the lack of steel reinforcements in the walls, and due to a lack of adequate bracing and other reinforcement in the roof structure.

The public has a right to know about collapse-risk buildings and vulnerable infrastructure so they can make informed decisions about their continued use. All public agencies must survey

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and make available information on all transportation systems and classes of buildings most susceptible to earthquake damage or collapse.

In 1986, the State of California enacted legislation requiring local jurisdictions to catalog their unreinforced masonry (URM) buildings and develop a retrofit program. In 2002, the Association of Bay Area Governments (ABAG) surveyed the 109 cities and counties in the nine-county region abutting San Francisco Bay about the status of local earthquake mitigation. As of 2004, nearly half of the 6,718 URM buildings identified in the Bay Area have been mitigated, through retrofit or demolition.

In addition to the state-mandated inventory of unreinforced masonry buildings, 40 percent of responding local governments had conducted an inventory of at least one other type of potentially hazardous private building (i.e., nonductile concrete frame, tilt-ups, and soft-story one-and two-story residences). According to the California Seismic Safety Commission’s report: “The Right to Know, Disclosure of Seismic Hazards in Buildings, CSSC 92-03”, in 2004, the Bay Area’s overall mitigation rate for unreinforced masonry (demolitions plus retrofits divided by the total number of buildings) was only 49 percent and considerably lower than the statewide rate of 69 percent in other areas with active earthquake faults. It is, however, an increase of three percent over the Bay Region’s 46 percent mitigation rate in 2003.

Following are the results of a 1999 Report to the Legislature on the status of the Unreinforced Masonry Building Survey of City and County Mitigation Efforts by the State of California Seismic Safety Commission. In 2008 this list has been updated to reflect the most current status of unreinforced masonry buildings in Emeryville.

Jurisdiction								Survey Results (Number of URMs)							
Inventory Completed	Number Historic URM	Number Non-Historic URM ¹	Mitigation Program Established	Replied to 2003 Survey	Uniform Code for Building Conservation (UCBC); (IEBC) ²	Compliance Jurisdiction Program	Partial Compliance/Under Construction	Retrofit Permit Issued	Plans Submitted	Reduced Occupancy	Demolished	Slated for Demolition	Warning Placards	No Mitigation Progress	Owners Notified
Emeryville															
Yes	0	78	Yes	Yes	29	44	0	0	0	0	4	0	0	1	78
Mitigation Program Type: Mandatory Strengthening, Structural analysis and report and mitigation by August 1993.															
Technical Mitigation Standards: Ordinance															
Progress and Remarks: Report update as of September 30, 2008: ¹ Initial URM building inventory for NON historic URM numbered 105, after further investigation, subsequently reduced by 26 to 78 totals. ² International Existing Building Code Appendix A1 applicable beginning January 1, 2008															

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The City's Building Division implements and enforces the Emeryville Municipal Code and the California Building Code regulations relative to seismic risk to development. A City Ordinance specifies the need and establishes guidelines for the seismic upgrade of unreinforced masonry buildings. An increase in occupancy or intensification of use triggers the requirement for a seismic upgrade. Over the past ten years 75 percent of the City's unreinforced masonry buildings have been upgraded for seismic safety. The City also provides a program for voluntary upgrades of single family homes.

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HAZUS Analysis

As part of the development of this LHMP, an earthquake scenario was created in HAZUS-MH, the FEMA-approved software program for estimating potential losses from disasters.

For the HAZUS Analysis scenario, a magnitude 7.8 earthquake on the San Andreas Fault with an epicenter at 37.70° N Latitude, 122.50° W Longitude, was simulated replicating the historical 5:12 a.m. April 18, 1906 earthquake.

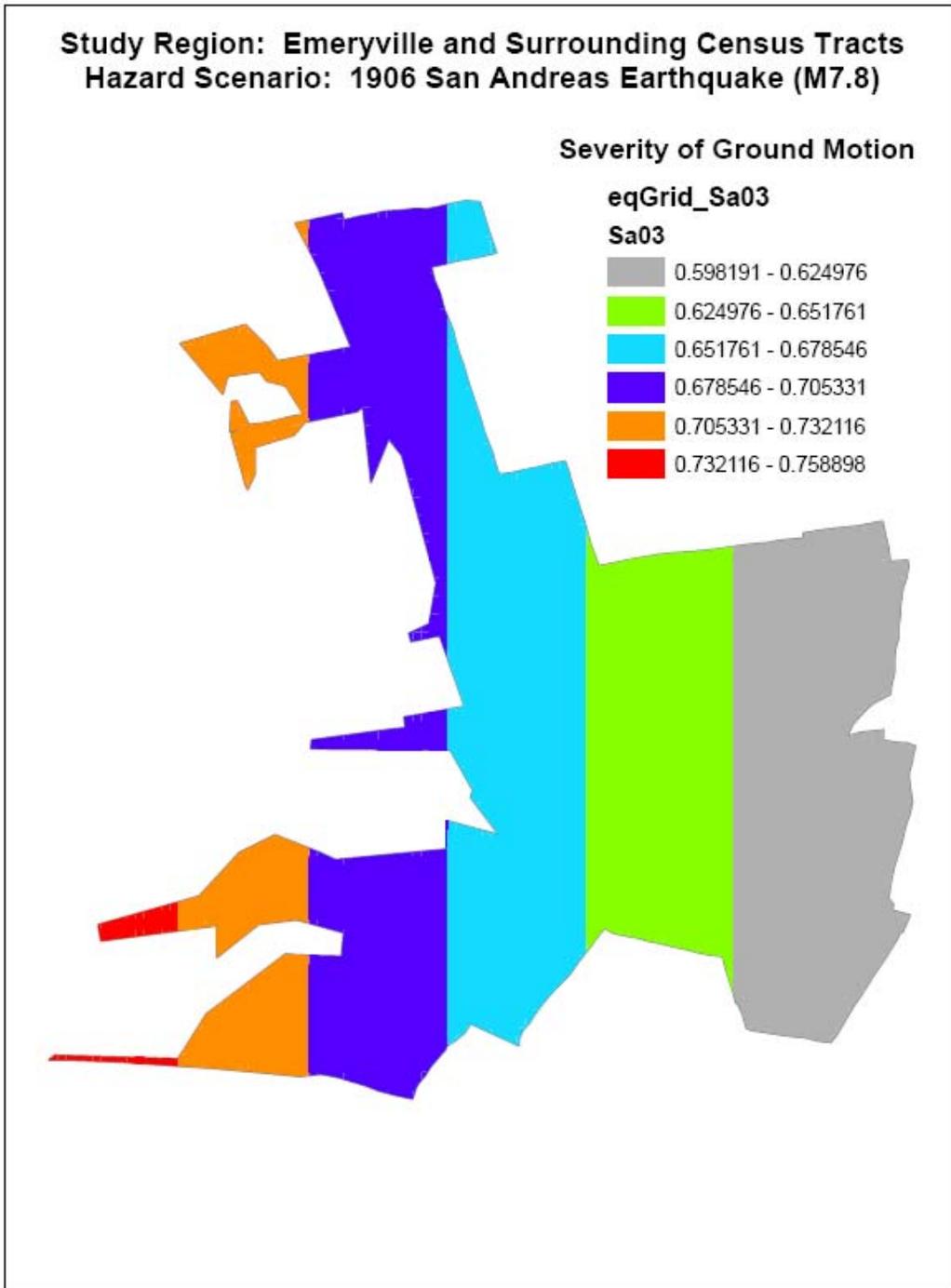
The results produced by HAZUS are reported by census tract. The Loss Estimates are stated in \$thousands. The summarized results for Emeryville are presented on the pages immediately following.

The following map indicates the epicenter (noted with a star) of the 1906 earthquake. Also shown are the areas with the highest ground-motions and subsequent damage if a similar magnitude earthquake were to occur today.



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Casualties Summary Report

October 30, 2008

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Alameda					
Casualties - 2am					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	6	2	0	1	9
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	2	1	0	0	3
<i>Industrial</i>	7	2	0	1	10
<i>Other-Residential</i>	105	28	4	8	146
<i>Single Family</i>	17	2	0	0	19
Total Casualties - 2am	138	35	5	10	188
Casualties - 2pm					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	340	97	16	31	484
<i>Educational</i>	41	11	2	4	58
<i>Hotels</i>	0	0	0	0	1
<i>Industrial</i>	54	16	2	5	77
<i>Other-Residential</i>	20	5	1	2	27
<i>Single Family</i>	3	0	0	0	4
Total Casualties - 2pm	458	130	21	41	650
Casualties - 5pm					
<i>Commuting</i>	5	7	12	2	26
<i>Commercial</i>	214	61	10	19	305
<i>Educational</i>	9	2	0	1	12
<i>Hotels</i>	1	0	0	0	1
<i>Industrial</i>	34	10	2	3	48
<i>Other-Residential</i>	41	11	2	3	56
<i>Single Family</i>	6	1	0	0	7
Total Casualties - 5pm	309	92	25	29	456
Region Total	NA	NA	NA	NA	NA

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Direct Economic Losses For Buildings

October 30, 2008

All values are in thousands of dollars

	Capital Stock Losses					Income Losses				Total Loss
	Cost Structural Damage	Cost Non-struct. Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Losses	Rental Income Loss	
California										
Alameda	125,332	465,248	189,180	9,816	10.7	2,506	48,704	58,635	44,399	943,821
Total	125,332	465,248	189,180	9,816	11.0	2,506	48,704	58,635	44,399	943,821
Region Total	125,332	465,248	189,180	9,816	10.7	2,506	48,704	58,635	44,399	943,821

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Study Region : Emeryville22
Scenario : Emeryville 1906 San Andreas Scenario

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Earthquake Hazard Report

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Direct Economic Loss For Transportation

October 30, 2008

All values are in thousands of dollars

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
California								
Alameda								
<i>Segments</i>	0	0	0					0
<i>Bridges</i>	101,680	5	76					101,760
<i>Tunnels</i>	0	0	0					0
<i>Facilities</i>		4,629	0	0	5,414	0	0	10,044
Total	101,680	4,634	76	0	5,414	0	0	111,803
Total	101,680	4,634	76	0	5,414	0	0	111,803
Region Total	101,680	4,634	76	0	5,414	0	0	111,803

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Study Region : Emeryville22

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Scenario : Emeryville 1906 San Andreas Scenario

Earthquake Hazard Report

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Direct Economic Loss For Utilities

October 30, 2008

All values are in thousands of dollars

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
California							
Alameda							
Facilities	0	14,270	0	0	23,570	115	37,955
Pipelines	854	675	0	722			2,251
Total	854	14,946	0	722	23,570	115	40,206
Total	854	14,946	0	722	23,570	115	40,206
Region Total	854	14,946	0	722	23,570	115	40,206

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Study Region :Emeryville22

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Scenario : Emeryville 1906 San Andreas Scenario

Earthquake Hazard Report

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Seismic Hazards Plans and Programs

Emeryville has Plans and Programs in place to regulate development, including remodeling or structural rehabilitation, to ensure:

- Adequate mitigation of safety hazards on sites having a history or threat of seismic dangers, erosion, subsidence, or flooding (areas west of Shellmound Street);
- Require geotechnical investigation of all sites proposed for development in areas where geologic conditions or soil types are susceptible to liquefaction;
- Require submission of geotechnical investigation and demonstration that project conforms to all recommended mitigation measures prior to city approval (as required by State law);
- Continue to require soil erosion control measures during construction;
- Retrofit remaining potentially hazardous structures, such as unreinforced masonry buildings or buildings lacking seismic retrofit;
- Encourage property owners to abate or remove structural hazards that create unaccepted levels of risk; and
- Enforce regulation of potentially hazardous structures to be retrofitted and made safe.

Current Seismic Mitigation Goals and Policies

Emeryville's General Plan includes the following Geologic, Soils and Seismic Hazards Goals and Policies.

Goals

Protection of life, natural environment, and property from natural and manmade hazards due to seismic activity, hazardous material exposure or flood damage.

Policies

CSN-P-28. The City will continue to regulate development, including remodeling, or structural rehabilitation, to ensure adequate mitigation of safety hazards on sites having a history or threat of seismic dangers, erosion, subsidence, or flooding.

CSN-P-29. The City will require geotechnical investigation of all sites proposed for development in areas where geologic conditions or soil types are susceptible to liquefaction. The City also requires submission of geotechnical investigation and demonstration that project conforms to all recommended mitigation measures prior to City approval (as required by State law)

CSN-P-30. The City will continue to require soil erosion control measures during construction.

CSN-P-31. The City will enforce regulation of potentially hazardous structures to be retrofitted and made safe and encourage property owners to abate or remove structural hazards that create unaccepted levels of risk.

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CSN-P-41. San Pablo Avenue, Hollis Street, and Interstate 80 will continue to serve as evacuation routes in case of emergency.

CSN-P-42. The City will continue to require minimum roadway widths to ensure access for emergency vehicles.

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4.2 Hazard: Flooding

Flooding risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to Emeryville.

Probability: Low	Severity: Medium
-------------------------	-------------------------

Hazard Definition

A flood is defined as an overflowing of water onto an area of land that is normally dry. Floods generally occur from natural causes, usually weather-related, often in conjunction with a wet or rainy spring or with sudden and very heavy rainfalls. Floods can, however, result from human causes such as a dam impoundment bursting or the catastrophic failure of a large diameter water main. Dam break floods are usually associated with intense rainfall, prolonged flood conditions, or earthquakes.

Dam failure may also be caused by faulty design, construction, and operational inadequacies. The cause can also be due to a flood event or earthquake larger than the dam was designed to accommodate. The degree and extent of damage depends on the size of the dam and circumstances of failure. A small dam retaining water in a stock pond may break resulting in little more damage than the loss of the structure itself. In contrast, a dam break could result in the loss of irrigation water for a season causing extreme financial hardship to many farmers. An even larger dam failure might bring about considerable loss of property; destruction of cropland, roads, utilities; and loss of life. Other consequences can include loss of income, disruption of services, and environmental devastation.

Floods are generally classed as either slow-rise or flash floods. Slow-rise floods may be preceded by a warning time lasting from hours to days, or possibly weeks. Evacuation and sandbagging for a slow rise flood may lessen flood-related damage. Conversely, flash floods are the most difficult for which to prepare due to the extremely short warning time, if there is any at all. Flash flood warnings usually require immediate evacuation. On some occasions adequate warning may be impossible.

For floodplain management purposes, the following discussion describes the Federal Emergency Management Agency (FEMA) definition of "100-year flood." The term "100-year flood" is misleading. It is not a flood that will occur once every 100 years. Rather, it is the flood elevation that has a one percent chance of being equaled or exceeded each year. Thus, a 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is 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 a map has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage.

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History

Emeryville lies in the Central Basin within the San Francisco Bay hydrologic region. Although the topography of the City is generally flat, its elevation ranges from 0 to 60 feet above mean sea level and slopes down slightly to San Francisco Bay, which is a major receiving water body. The other surface water feature in the City is Temescal Creek, which flows west from the East Bay Hills into San Francisco Bay.

Emeryville has had a number of sites that have been susceptible to floods, such as the areas east of the Southern Pacific railroad tracks, including the Hollis Street business areas and the Federal Post Office property. Low lying areas affected by tidal and high winds have been and are susceptible to damage and flooding in the west peninsula shoreline area. Prior to 1963, periodic flooding and erosion occurred along Temescal Creek resulting in extensive property damage. The floodplain of the creek was then incorporated into Alameda County Flood Zone 12 and a deeper and wider concrete channel was constructed to contain the 100-year flood level.

The following table depicts the most recent flood events near Emeryville in Alameda County.

Location	Date	Type	Reported Property Damage/Description
Countywide	12/31/2005	Flood	\$8.8M property damage. Widespread flooding affected the County during the severe winter storm. Approximately two to four inches of rain fell in less than a 24 hour period, causing urban and small stream flooding. Much of the damage was done to public property, mainly City and County facilities. The flooding continued into the first few days of January 2006.
Countywide	12/13/2002	Urban/small stream flooding	December turned out to be one of the wettest on record at many locations throughout the County. There were three primary episodes of precipitation in December, the first a two-day storm on the 9th and 10th. With less than an inch and a half accumulation at any one location over the period, flooding problems were not an issue. However, the rainfall totals helped to further saturate the soil. The next and by far most serious storm episode begin on the 13th of the month and lasted on and off through the 21st. A very strong and moist jet stream developed across the Pacific Ocean and brought a series of storms into California. Wave after wave of locally heavy rain pounded the north bay counties for days. Flooding became a serious issue, not just for urban and small stream flooding, but for mainstream flooding as well. Urban and small stream flooding did occur and there was great concern for possible mudslides due to the saturation of the soil. Historically, December 2002 became the 6th wettest in downtown San Francisco, our most well known location, since records began in 1849. The total of 12.03 inches was 378 percent of normal and accounted for 54 percent of the total seasonal rainfall for that location. At the end of December seasonal rainfall totals averaged 150 to 200 percent of normal for San Francisco and the north bay areas.

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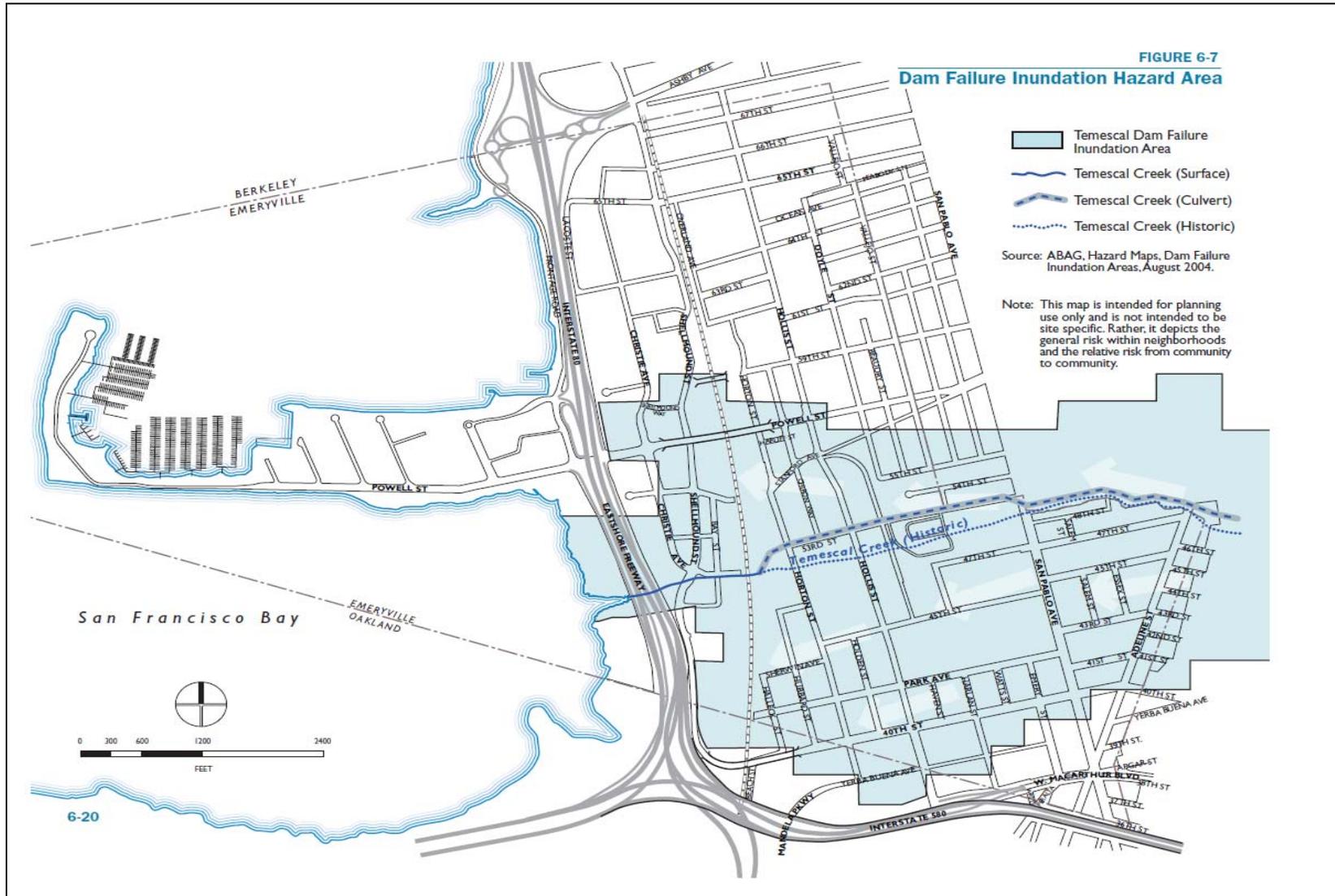
Location	Date	Type	Reported Property Damage/Description
Countywide	01/25/1997	Flash Flood	A new round of rain storms brought more flooding problems to the bay area.
Countywide	01/02/1997	Flash Flood	Moderate to heavy rain moved over the warning areas with the heaviest rates of 1/2 to 1 1/2 inches per hour for a period of three hours. The ground continued to be saturated. Rainfall rates of 1/3 to 1/2 inch per hour have been noted. Smaller rivers and streams continued to rise.
Countywide	01/01/1997	Flash Flood	Heavy rain fell across most of Alameda County with rain gages showing rates of about one inch per hour. Flooding was occurred across many of the highways and local streams and creeks were near bank full. River and streams were high and the ground saturated. Rain caused urban flooding and flooding of creeks, small rivers, and streams.
Countywide	12/10/1996	Flash Flood	This Pacific storm caused widespread damage through the entire countywide area.

Source: NOAA National Climatic Data Center

The following maps show the Temescal Dam failure inundation areas and other water features in Emeryville.

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Flooding in the City could occur as a result of storm-induced flooding, inundations from dam failure, and tsunamis as discussed below.

San Francisco Bay

The City lies in the San Francisco Bay watershed. San Francisco Bay is the most prominent surface water body that receives surface water runoff from the City and groundwater discharge from the East Bay Plain. The southern portion of the Bay shoreline in the City includes a salt marsh. Rocks in the form of riprap have been installed along the deeper waters adjacent to the Emeryville Peninsula for erosion control.

Temescal Creek

Temescal Creek, a main drainage outfall within the City, is a channelized creek draining a large tributary area of Oakland and Lake Temescal. It flows through the City, passes under Interstate 80, and discharges into San Francisco Bay in the Emeryville Crescent. The creek is dry most of the year and runs underground through portions of the City. Currently, the creek flows are partially regulated by the Lake Temescal Reservoir.

Groundwater Basins

Emeryville is located within the East Bay Plain Groundwater Basin 4 in Alameda County. The East Bay Plain extends up to 114 square miles. The water table (or the upper limit of the saturated groundwater zone) in the City is relatively high, occurring only several feet below the ground surface in some areas of the City.

Stormwater Drainage

Surface runoff from Emeryville flows through Temescal Creek, or is collected in local storm drains and is discharged directly into the Bay. The City is highly urbanized and primarily covered with pavement, buildings, areas of surface-compacted soil, and other features that allow only minimal infiltration of rainfall into the soil.

Storm-Induced Flooding

The Alameda County Public Works Agency is responsible for maintaining stormwater infrastructure from County roads and bridges to flood channels and natural creeks in Alameda County. Within the Public Works Agency, the Alameda County Flood Control and Water Conservation District works to protect the natural environment and the public from flooding. Emeryville falls under the jurisdiction of Flood Control Zone 12. Prior to 1963, periodic flooding and erosion occurred along Temescal Creek resulting in extensive property damage. The floodplain of the creek was then incorporated into Alameda County Flood Zone 12 and a deeper and wider concrete channel was constructed to contain the 100-year flood level. The lower portion of Temescal Creek flood control channel is subject to tidal action that ranges from three to six feet daily. Water depths in the channel vary from zero to six feet with the tides.

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Global Climate Change and Sea Level Rise

While climate change is a global concern, the local effects, in terms of flooding and sea level rise, could be severe within Emeryville. According to the Union of Concerned Scientists, the sea level in California is expected to rise up to 12 inches by 2100. This could, in turn, erode bay shores, marshes and wetlands, and increase the salinity of rivers. In addition, if average temperatures increase, this could shorten the snowfall season in the Sierra Mountains, increasing the amount of rain and the rate of snow melt, thereby threatening even coastal cities, such as Emeryville, with increased flooding.

Inundation from Dam Failure

The closest dam near Emeryville is the dam at Lake Temescal, which is located approximately 3.5 miles east of the City limits. Lake Temescal Dam is managed by the East Bay Regional Parks District and is overseen by the California Department of Water Resources, Division of Safety of Dams (DSOD). The DSOD supervises dam maintenance and inspections. Dams are required to adhere to rigorous DSOD standards, which include seismic analysis of existing dams to assure their integrity and conducting regular inspections. As of 2008, records indicate the Lake Temescal Dam was last inspected in September 2007, revealing no concerns for stability—particularly in light of fill from Highway 24 buttressing the dam and its wide cross section (Department of Water Resources, Division of Dam Safety, correspondence with Regional Engineer, August 2008). The likelihood of flood hazard is dependent upon the occurrence of a major earthquake and the ability of the dam to withstand seismic activity. If the dam were to fail, it is estimated to cause overflowing of Temescal Creek with inundation of nearly 1,000 feet of area on either side of the creek within 15 minutes. The water could reach the rest of the City, west toward the Bay, and north approximately to Powell Street within 25 minutes.

Tsunamis

Tsunamis are caused by sudden seawater displacement in an ocean from an impact upon the ocean surface of astrophysical objects or landslides, or from submarine seismic or volcanic disturbances which alter the seafloor bottom. “Far field” events are those sudden displacements of seawater which occur anywhere in the Pacific Ocean Basin resulting in tsunami impact along the California Coast and in particular at the entrance to San Francisco Bay at the Golden Gate. The U.S. Geologic Survey estimates that a 20-foot wave at the Golden Gate Bridge (an event estimated to possibly occur once in 200 years) could potentially cause a run-up of a 10-foot wave in the Emeryville Peninsula and the shoreline area.

In contrast, “near field” events result in tsunamis caused by landslides or seismic-induced sea floor displacement either at the Golden Gate or very near to it. In Emeryville’s case, a landslide of the southern escarpment of the Marin Headlands, perhaps triggered by a seismic event along the San Andreas Fault, could displace a significant volume of seawater in the straits of the Golden Gate. A seismic displacement of the sea floor immediately offshore of the Golden Gate could likewise spawn a “near field” tsunami event.

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Geographic Areas Affected

The City has examined the flooding hazard exposure of urban land, infrastructure, critical health care facilities, schools, city-owned buildings and other businesses and has identified that:

- 100 acres are in the 100-year flood plain, while an additional 40 acres are in other flood-prone areas;
- Of the 10 miles of roadway in the City zero miles of roadway are in the 100-year flood plain and one mile is in other flood-prone areas;
- No critical health care facilities are found in either the 100-year flood plain or in other flood-prone areas;
- No critical health care facilities, schools, or city-owned properties are in areas subject to dam inundation.

Flood Zone

Pursuant to the letter from the Department of Housing and Urban Development, Federal Insurance Program, the January 16, 1976 Flood Hazard Boundary Map (Map H-01-02) was rescinded effective April 21, 1978. Currently, Emeryville no longer has a Flood Hazard Boundary Map. The entire City is designated as Zone C (an area that is determined to be outside the 100- and 500-year floodplains; i.e., area of minimal flooding; same category as Zone X-see below) by the National Flood Insurance Program (NFIP). In Zone C, flood insurance is on a voluntary basis.

However, in December 2007, FEMA provided copies of the preliminary Flood Insurance Study (FIS) report and Flood Insurance Rate Map (FIRM) for the City of Emeryville that established Special Flood Hazard Areas (SFHAs) within the community. The preliminary FIS report and FIRM will be finalized and become effective on August 3, 2009 and areas of Emeryville will then be designated as both:

- Flood Zone V - Coastal areas with a one percent or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 25 percent chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within this Zone. In communities that participate in the NFIP, mandatory flood insurance purchase requirements will apply to this Zone and;
- Flood Zone X - Areas outside the one percent annual chance floodplain; areas of one percent annual chance sheet flow flooding where average depths are less than one foot; areas of one percent annual chance stream flooding where the contributing drainage area is less than one square mile; or areas protected from the one percent annual chance flood by levees. No base flood elevations or depths are shown within this Zone. Insurance purchase is not required.

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According to a 2006 ABAG study, the building loss exposure due to flooding and/or dam failure inundation for the City of Emeryville is as follows:

Jurisdiction: Emeryville County: Alameda	Total	500-Year Flood Plain or Other Concern (Q3 Zone X 500)	100-Year Flood Plain (Q3 Zone V or A)
RESIDENTIAL AND MIXED USE PROPERTIES			
Number of properties	411	59	211
Estimated market value in \$Millions	\$123	\$20	\$58
COMMERCIAL AND RECREATIONAL PROPERTIES			
Number of properties	86	20	17
Estimated market value in \$Millions	\$671	\$53	\$141
INDUSTRIAL AND OTHER PROPERTIES			
Number of properties	190	56	32
Estimated market value in \$Millions	\$272	\$51	\$89
GRAND TOTAL			
Number of properties	687	135	260
Estimated market value in \$Millions	\$1,066	\$124	\$288

Repetitive Loss Properties

According to the 2008 FEMA NFIP Statistics, Emeryville has claimed a total of three losses totaling \$6,208.61 since 1978. In spite of the areas in Emeryville located in flood-prone areas, there are NO repetitive loss properties in the City.

Risk Assessment

A dam failure is the partial or complete collapse of an impoundment, with the associated downstream flooding. Flooding of the area below the dam may occur as the result of structural failure of the dam, overtopping, or a seiche. Dam failures are caused by natural and manmade conditions. The list of causes includes earthquake, erosion of the face or foundation, improper sitting, structural or design flaws, and prolonged rainfall and flooding. The primary danger associated with a dam failure is the swift, unpredictable flooding of those areas immediately downstream of the dam.

The likelihood of a flood hazard in Emeryville is dependent upon the occurrence of a major earthquake and the ability of the Lake Temescal Dam to withstand seismic activity. If the dam were to fail, it is estimated to cause overflowing of Temescal Creek with inundation of nearly 1,000 feet of area on either side of the creek within 15 minutes. The water could reach the rest of the City, west toward the Bay, and north approximately to Powell Street within 25 minutes. USGS estimates that a 20-foot wave at the Golden Gate Bridge (an event estimated to possibly

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occur once in 200 years) could potentially cause a run-up of a 10-foot wave in the Emeryville Peninsula and the shoreline area. This estimate is for “far field” events; there are no probability estimates of the likelihood or severity of a “near field” event. In terms of relative risk, however, a “far field” event is likely to have a warning time of one to eight hours or more through the Pacific Tsunami Warning System. Given the high rate of speed for tsunamis, a “near field” event is likely to provide little warning time to Emeryville prior to sea wave run-up and inundation. Depending upon the size of a “near field” landslide or seafloor displacement, a tsunami so generated has the potential to severely inundate most of Emeryville.

- **Effects on people and housing.** Direct impacts of flooding can include injuries and loss of life, damage to property and health hazards from ruptured sewage lines and damaged septic systems. Secondary impacts include the cost and commitment of resources for flood fighting services, clean-up operations, and the repair or replacement of damaged structures.
- **Effects on commercial and industrial structures.** Depending on the geographic area involved and the economic and demographic characteristics of the area, the effects on industry and commerce may be significant.
- **Effects on infrastructure.** A slow-rising flood situation will progress through a series of stages, beginning with minor rainfall and evolving to a major event such as substantial flooding. Once flooding begins, personnel will be needed to assist in rescuing persons trapped by flood waters, securing utilities, cordoning off flood areas, and controlling traffic. These actions may overtax local agencies, and additional personnel and resources may be required. It is anticipated that existing mutual aid resources would be used as necessary to augment local resources. Flooding can cause damage to roads, communication facilities and other infrastructure.

Risk assessment conclusion. Emeryville lies in the Central Basin within the San Francisco Bay hydrologic region. Although the topography of the City is generally flat, its elevation ranges from 0 to 60 feet above mean sea level and slopes down slightly to San Francisco Bay, which is a major receiving water body. The other surface water feature in the City is Temescal Creek, which flows west from the East Bay Hills into San Francisco Bay. In a relative sense, flooding due to precipitation does not present the degree of danger posed by other hazards such as major earthquakes; on the other hand, if there is flooding due to dam failure, the danger could be cataclysmic.

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Current Flood Mitigation Goals and Policies

Emeryville's General Plan includes the following Flood Hazard mitigation measures.

Goals

Protection of life, natural environment, and property from natural and manmade hazards due to seismic activity, hazardous material exposure or flood damage.

Policies

CSN-P-38. The City will continue to require development projects to implement on-site stormwater management measures through the City's development permit process.

CSN-P-39. Storm drains shall be maintained and replaced or upgraded as needed to reduce potential flooding.

CSN-P-41. San Pablo Avenue, Hollis Street, and Interstate 80 will continue to serve as evacuation routes in case of emergency.

CSN-P-42. The City will continue to require minimum roadway widths to ensure access for emergency vehicles.

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4.3 Hazard: Wildfire

Wildfire risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to Emeryville.

Probability: Low	Severity: Medium
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Hazard Definition

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to property and lives. Wildfires can occur in undeveloped areas and spread to urban areas where structures and other human development are more concentrated.

Fires that occur within the urban-wildland interface areas affect natural resources as well as life and property. This type of fire is described as “a fire moving from a wildland environment, consuming vegetation for fuel, to an environment where structures and buildings are fueling the fire” (California Resources Agency, 1996).

While some wildfires start by natural causes, humans cause four out of every five wildfires. Wildfires started by humans are usually the result of debris burns, arson, or carelessness. As a natural hazard, a wildfire is often the direct result of a lightning strike that may destroy personal property and public land areas, especially on state and national forest lands. The predominate dangers from wildfires are:

- The destruction of timber, property, wildlife; and
- Injury or loss of life to people living in or traveling through the affected area or using the area for recreational facilities.

History

Fortunately the City of Emeryville does not have the terrain and vegetation conditions for large or devastating wildfires. However, urban fires are a constant threat. The worst case urban fire could be associated with an earthquake. The section of Shoreline Park on the Emeryville Peninsula does have brush and vegetation and could cause a serious smoke threat if ignited.

Risk Assessment

- **Effects on people and structures.** In addition to damaging natural environments and health hazards of wildfire smoke, wildfires can injure and kill residents and firefighters, as well as damage or destroy structures and personal property.

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- **Effects on infrastructure.** In addition to damaging residences and structures and injuring and killing residents and firefighters, wildfires also deplete water reserves, down power lines, disrupt telephone service, and block roads. They can also indirectly cause floods, if flood control facilities are inadequate to handle an increase in storm runoff, sediment, and debris that is likely to be generated from barren, burned-over hillsides.
- **Effects on transportation corridor.** A wildfire in or around the vicinity of the Shoreline Park on the Emeryville Peninsula south of Powell Street is likely to produce smoke which, given certain wind and temperature conditions, may result in severe smoke impingement upon the I-80/I-580 corridor and interchange with I-880 (the “Maze” Interchange). An average of 230,000 vehicles a day transits this portion of freeways. Heavy smoke carried by wind and overlaying the freeway will reduce visibility for drivers along portions of this very dense transportation corridor. Loss of driver visibility is likely to increase the risk of collisions, vehicle damage, vehicle fire, and occupant injury and fatality.

Risk assessment conclusion. The potential for wildfires in Emeryville is very low due to the terrain and vegetation conditions of the City, including the Shoreline Park area; however, any urban fires are a constant threat. The potential for loss of life and property from urban fire hazards is greatest in places where large groups of people gather, such as offices, stores, hotels, high-rise buildings and theaters. Uses which may suffer large monetary losses due to a major fire include businesses, factories, and shopping areas.

Geographic Areas Affected

The City has examined the wildfire hazard exposure of urban land, infrastructure, critical health care facilities, schools, city-owned buildings and other businesses and has identified that:

- No roads are subject to high, very high, or extreme wildfire threat;
- No schools or city-owned facilities are in wildland-urban interface threat areas.

Current Fire Mitigation Plans, Program and Policies

The City of Emeryville’s General Plan includes the following Fire Hazard mitigation measures.

Plans and Programs

The City of Emeryville Fire and Emergency Services Department (EFESD) has mutual aid agreements with the fire departments of Oakland and Berkeley; a mutual aid agreement with all of the other fire agencies of Alameda County; and a master mutual aid agreement with the California Emergency Management Agency. The Oakland and Berkeley fire departments automatically respond to freeway accidents in the area and can be called for help with any other incident.

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The EFESD has an Emergency Management Operation Plan for the City of Emeryville. Evacuation routes from the City in the case of an emergency depend on the circumstances, although San Pablo Avenue, Hollis Street, and I-80 are major routes. The City has an informal understanding with AC Transit that they would help evacuate people in an emergency. The department has the ability to monitor the state emergency evacuation routes through webcams.

Policies

CSN-P-40. The City will continue to specify minimum water pressure flows to ensure adequate flow in the event of a fire.

CSN-P-41. San Pablo Avenue, Hollis Street, and Interstate 80 will continue to serve as evacuation routes in case of emergency.

CSN-P-42. The City will continue to require minimum roadway widths to ensure access for emergency vehicles.

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4.4 Hazard: Extreme Weather

Extreme Weather risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to Emeryville.

Probability: Medium	Severity: Low
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Hazard Definition

Extreme weather hazards in Emeryville include:

- Thunderstorms/Windstorms
- Heavy Rain/Hailstorms
- Tornados
- Drought

History

The following tables depict extreme weather incidents occurring in Emeryville.

Location	Date	Type	Reported Property Damage/Description
Countywide	12/07/2004	High Wind, Magnitude 82 knots	Measured by Bay Area Air Quality Management Wind Sensor.
Countywide	02/25/2004	High Wind, Magnitude 63 knots	Strong winter storm produced 63 mph wind gust.
Countywide	02/17/2004	High Wind, Magnitude 74 knots	Strong winter storm produced a 74 mph wind gust in the East Bay Hills.
Countywide	01/01/2004	High Wind, Magnitude 71 knots	Winds gusted to 71 mph in the East Bay Hills.
Countywide	12/14/2003	High Wind, Magnitude 62 knots	High winds hit the Bay Area with winds gusting to 62 mph in the East Bay Hills, causing thousands of power outages.
Countywide	12/30/2002	High Wind, Magnitude 63 knots	\$600,000 property damage. Wind damage sent metal roofing on the road, large trees downed, power lines downed.
Countywide	11/07/2002	High Wind, Magnitude 100 knots	Total damage to the area has been estimated at \$2.5M from this storm. One very strong weather system affected central California during November. For a three-day period starting on the 7th of the month, rainfall totaling 2-5 inches fell across the North Bay counties, 2-4 inches fell across the San Francisco Peninsula, 1-3 inches fell across the East Bay, 1-4 inches fell across the South Bay. Only urban and small stream advisories were needed. Strong winds at San Francisco airport blew the roof off a large aircraft hangar. Many trees and branches

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Location	Date	Type	Reported Property Damage/Description
			were down blocking roads and interrupting power. Winds also blew down power poles and lines. As many as one million homes were without power at one time. A number of trees fell on homes and automobiles.
Countywide	07/10/2002	Blizzard	\$50,000 property damage
Countywide	11/24/2001	High Wind, Magnitude 85 knots	\$7.1M property damage
Countywide	01/25/2001	High Wind, Magnitude 90 knots	A strong cold front swept over the area from the northwest. It formed a squall line which produced high winds, small hail and snow as low as 800 feet. A severe thunderstorm watch was issued. It was only the second in 25 years for the San Francisco Bay area. No severe thunderstorms were reported. There was damage from mainly strong gradient winds and lightning strikes. A number of trees were downed causing power outages to the Bay area.
Countywide	12/18/2000	High Wind, Magnitude 66 knots	\$1.1M property damage. The Oakland Hills section of Alameda County experience winds gusting as high as 66 mph with gust of 71 mph according to the observation on Mt. Diablo. Power to over 2500 customers was lost due to trees blowing into power lines. Three cars were crushed by two trees falling into the road. Hwy 13 and the entry ramp to I-580 snarled traffic as trees were blown down across these roads.
Countywide	10/21/2000	High Wind, Magnitude 97 knots	One injury reported.
Countywide	12/21/1999	High Wind, Magnitude 61 knots	\$125,000 property damage. A strong high pressure inland and a low offshore created strong north easterly down slope wind and a strong offshore gradient created high down slope winds in the Oakland hills area. A number of large trees were downed and power was lost for 10,000 residents.
Countywide	02/09/1999	Hail .75 inches; High Wind	\$1.0M property damage.
Countywide	12/16/1998	High Wind, Magnitude 61 knots	\$50,000 in property damage.
Countywide	11/29/1998	High Wind, Magnitude 75 knots	\$1.8M property damage.
Oakland Area	12/05/1996	Heavy Rain	\$1.0M property damages. Widespread heavy precipitation from a Pacific storm. Large pine tree fell through a home in Oakland due to the wet soil and wind from the storm. Power was out to 3500 people in the area. Traffic accidents were nearly double the normal with 200 accidents occurring during the afternoon commute.
Oakland Area	03/04/1996	Thunderstorm Winds, Hail, Magnitude 45 knots	45 knot winds were reported by a spotter and he estimated them higher since it broke a high wind sensor. Scattered reports of ½ inch hail were reported and caused some traffic problems.
Countywide	12/12/1995	High Winds, Heavy	135 mph wind gust on hill at 1894 feet that destroyed the

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Location	Date	Type	Reported Property Damage/Description
		Rain	PG&E wind sensor. It buckled a radio tower and destroyed satellite communications dishes at the site. \$1.0M property damage. Three large ocean going vessels and a number of other large boats and barges and dock facilities in Oakland and San Francisco Bay were damaged in wind gust that were up to 75 mph resulting in \$5.0M in damages. There was 2.66 inches of rain in 45 minutes.
Countywide and multiple counties	12/09/1995	Winter Storm, High Winds	Fatalities: 1; injuries: 15; property damage: \$60M. Widespread winds over 40 mph with many reporting 60 to 80 mph. Reported maximum wind gusts of 135 mph from PG&E in San Francisco Area. Major damage in the San Francisco Bay Area where \$15 million was reported to the Arboretum and un-estimated damage to the magnificent trees in the Golden Gate park which was closed for nearly three weeks. Power outages to around 1.5 million people resulted from this storm and some power was out for more than a week causing great financial damage and personnel hardship. The wind strength and area coverage was labeled as the worst in the San Francisco Area since 1962-63. Two to five inches of rain fell with a maximum of 11.3 inches reported at Kentfield in Marin County. A good part of the area reported some flash flooding but mainly small stream and local flooding occurred. Two dozen roads closed due to flooding and downed trees. Many reports of houses and other building damaged by falling trees and broken glass due to wind driven debris. 169 schools closed in the area. From some of the paths of damage across the San Francisco area it could be determined that a wet down burst mechanism may have contributed to the wind damage.
Countywide	12/17/1992	Tornado, 23 yards wide	\$3,000 property damage
Countywide	02/03/1986	Thunderstorm Winds	None Reported
Countywide	04/19/1983	Thunderstorm Winds	None Reported
Countywide	03/29/1982	Tornado	\$25,000 property damage
Countywide	04/09/1974	Thunderstorm Winds	None Reported
Countywide	12/28/1964	Thunderstorm Winds, Magnitude 57 knots	None Reported

Source: NOAA National Climatic Data Center, U.S. Department of Commerce

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Drought

In addition to the extreme weather conditions cited above, in June 2008, California's Governor declared the first statewide drought in 17 years – setting the State for drastic cutbacks and diverting supplies from the relatively water-rich to the water-poor. The Governor called for a 20 percent reduction in water use statewide and urged local agencies to bolster conservation programs and to work with federal and other authorities to help farmers who are suffering huge financial losses and abandoning crops in droves. California's Governor lacks the authority to impose statewide rationing; however, the State Department of Water Resources could slash water supplies to local agencies, which then would be forced to institute rationing.

The Governor's pronouncement follows the driest spring on record and two years of below-normal precipitation for the State. Snow pack in the Sierra Nevada, the backbone of the State's water supply, stands at two-thirds of normal; dusty banks line many important reservoirs; and environmental rulings have slashed water pumped from the crucial Sacramento-San Joaquin River Delta - all while California's booming population threatens to overwhelm some of the State's key infrastructure.

Some water districts, including the East Bay Municipal Utility District (EBMUD), already have imposed rationing and threatened to fine or reduce water supply to customers who violate the restrictions. Most of the remaining Bay Area water districts have asked for voluntary cutbacks on the order of 10 to 20 percent.

Although EBMUD's current water supply is sufficient to meet demand during normal years, it is insufficient to meet customer demand in the case of a multi-year drought, despite its aggressive conservation and water recycling efforts. EBMUD will inevitably face water supply shortages during extended periods of drought, but additional supplemental supply projects currently underway will significantly reduce the severity and frequency of customer rationing.

Risk Assessment

- **Effects on people, housing, commercial and industrial structures and infrastructure.** Extreme weather incidents can cause extensive and costly damage to housing, commercial and industrial structures, infrastructure and even injury or loss of life. The danger is multiplied by the risks of power line downing, floods, and landslides/mudslides.

Risk assessment conclusion. Thunderstorms, heavy winds, heavy rainfall and tornados have all caused damage to Emeryville in the past and will no doubt occur again in the future. The East Bay Municipal Utility District (EBMUD) supplies water and wastewater treatment services to the City. Although EBMUD has a policy in place to reliably provide water through 2020, various events – such as earthquakes, drought, contamination, fires, and levee failure may disturb the availability and reliability of water.

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Relationship to Other Hazards – Cascading Effects

Thunderstorms, heavy winds, heavy rainfall and tornados carry the risks of floods, power and communications outages, landslides and mudslides, as well as the possibility of fire ignitions from downed power lines.

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4.5 Hazard: Hazardous Materials

Hazardous Materials risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to Emeryville.

Probability: Low+	Severity: High
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Hazard Definition

Hazardous materials consist of substances that by their nature, lack of containment, and reactivity, have the capability for inflicting harm. Hazardous materials poses a threat to health and the environment when improperly managed and can be toxic, corrosive, flammable, explosive, reactive, an irritant, or a strong sensitizer. Hazardous materials substances also include certain infectious agents, radiological materials, oxidizers, oil, used oil, petroleum products, and industrial solid waste substances. Hazardous materials can pose a threat where they are manufactured, stored, transported or used. They are used in almost every manufacturing operation and by retailers, service industries, and homeowners.

Hazardous material incidents are one of the most common technological threats to public health and the environment. Incidents may occur as the result of natural disasters, human error, and/or accident.

Hazardous materials incidents typically take three forms:

- Fixed facility incidents
 - It is reasonably possible to identify and prepare for a fixed site incident, because laws require those facilities to notify state and local authorities about what is being used or produced there.
- Transportation incidents
 - Transportation incidents are more difficult to prepare for because it is impossible to know what material(s) could be involved until an accident actually happens.
- Pipeline incidents
 - Pipelines carry natural gas and petroleum. Breakages in pipelines carry differing amounts of danger, depending on where and how the break occurs and what is in the pipe.

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History

The potential for an accident is increased in regions near roadways and rails that are frequently used for transporting hazardous materials or industrial facilities that use, store, handle, or dispose of hazardous materials. Most of Emeryville is located between the I-80 and I-580 freeways and the rail lines which currently handles heavy freight traffic traveling in and out of the busy Port of Oakland a couple of miles to the south, in addition to the various Amtrak trains.

Emeryville includes a mix of uses and there are many areas with a high concentration of historical industrial and manufacturing activities. Most of these areas have been largely converted or will be converted to other uses, such as office, commercial retail, and residential. Historically, heavy industry was the predominant land use in the City, but the majority of these types of companies left the area in the 1970s. Some of these industrial and manufacturing operations included Sherwin-Williams, Chevron, Westinghouse-Electric, Judson Steel, and Del Monte. Emeryville's economy struggled amid the exodus of industry and jobs and the legacy of soil and groundwater contamination.

Brownfields were scattered throughout the City. A brownfield is a site, or portion thereof, that has actual or perceived contamination and an active potential for redevelopment or reuse. In 1996, 234 acres in Emeryville were vacant or underused, and 213 acres were known to have soil and groundwater contamination. Although there is demand for residential and commercial development, the cost and risk associated with these brownfields have impeded their redevelopment. The result for the City was a loss of \$13.3 million in tax revenues and 450 jobs between 1991 and 1996.

Emeryville has been a leader in the financing and remediation of brownfields. In 1995, the U.S. EPA initiated a program to help states, communities, and others to redevelop abandoned contaminated land. The program provides grants that support revitalization efforts by funding environmental assessment, cleanup, and job training activities. The City of Emeryville has benefitted from the program, which has helped revitalize an area that industry abandoned during the 1970s. As of 2008, more than 40 sites totaling 240 acres had been targeted for cleanup and have been or are identified for redevelopment.

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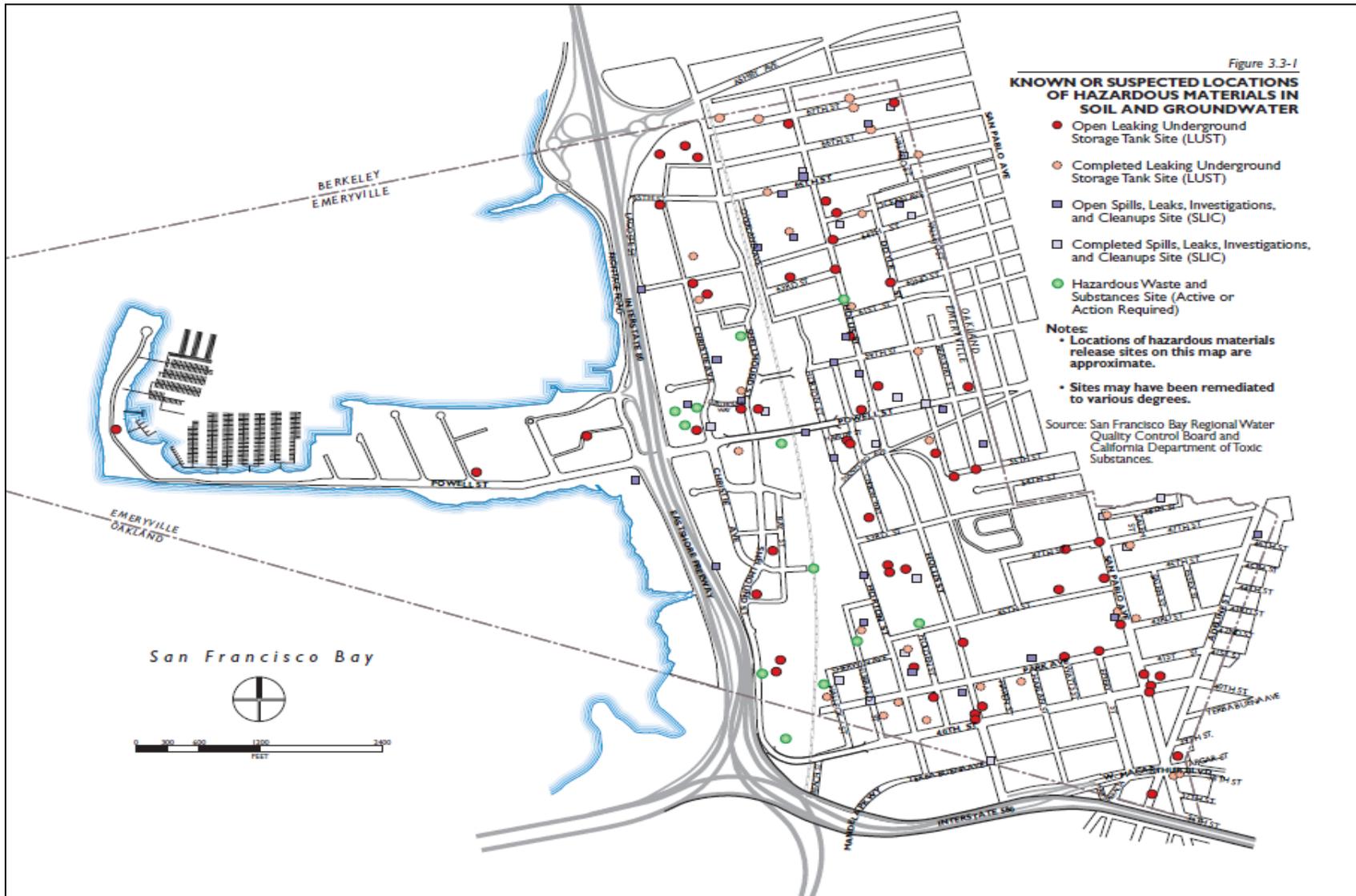
Below is a State of California Department of Toxic Substances Control list of hazardous waste and substances sites in Emeryville.

Site/Facility Name	Site/Facility Type	Cleanup Status	Address
Shellmound Venture	Voluntary Cleanup	Certified/Operation and Maintenance – Land Use Restrictions	Shellmound Street
Sherwin Williams	State Response	Active	1450 Sherwin Avenue
South Bay Front Site B	Voluntary Cleanup	Active	1525-1535 Powell Street and 5760-5770 Shellmound Street
South Bayfront Project	Voluntary Cleanup	Certified/Operation and Maintenance - Land Use Restrictions	4650, 5500, and 5600 Shellmound Street
Southern Pacific Right-Of-Way Emeryville	State Response	Active	West of 4525 Hollis Street
Technichem, Inc.	Haz Waste-Non-Operating	Active	4245 Halleck Street
Technichem, Inc.	State Response	Active	4245 Halleck Street
Tranzo/Lacoste Site	State Response	No Further Action	1600 64th Street/6401 Bay Street
UPRR Parcel D	Voluntary Cleanup	Refer: Other Agency	North of Sherwin Avenue and Halleck Street
Westinghouse Electric Co.- Emeryville	Voluntary Cleanup	Active	5899 Peladeau Street

Following is a map of known or suspected locations of hazardous materials in soil and groundwater in Emeryville.

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Listed below are Hazardous Materials Spill Reports occurring in Emeryville.

Date	Substance	Type	Location	Description
09/29/2008	Unknown Oil	Petroleum	Emery Cove Yacht Harbor	Caller stated an unknown sheen was discovered going by their harbor from an unknown source. Sheen is rainbow in color and 1000 ft x 100 ft.
08/15/2008	Oil	Petroleum	Emeryville Marina	Caller is reporting an unknown sheen in Emery Bay. Caller stated it appears that the sheen is coming from the gas dock area.
10/23/2007	Unknown Oil	Petroleum	Emery Cove Yacht Harbor	Information left off of initial report.
01/31/2000	Gasoline	Petroleum	Emeryville Marina	A boat had sunk and released an undetermined amount of gasoline and possibly paint and varnish.
10/12/1993	Unknown	Unknown	Emeryville	Clean-up
04/12/1989	Diesel Fuel	Diesel	Emeryville	On April 12, 2989 a fuel line ruptured at the Alameda County Transit Company in Emeryville releasing an estimated 20,000 gallons of diesel fuel into a storm drain that empties into a marsh. By the time the leak was discovered on April 13, the ground had become saturated and the oil-water separator on the facility had malfunctioned.

Source: CalEMA; NOAA

Risk Assessment

Hazardous material use, storage, transport, and hazardous waste generation within the City can pose hazards to the environment and public health through improper handling or storage. If a railway derailment or hazardous spill on the Interstate should occur, the City's concerns would be evacuation of the neighboring communities, water canal contaminations, and the containment of escaping gases or liquids. September 11 and subsequent news reports indicating that some terrorists in the United States have obtained drivers licenses for transporting hazardous materials, including hazardous wastes, called attention to a new form of hazmat threat.

Hazardous material use, storage, transport, and hazardous waste generation within the City can pose hazards to the environment and public health through improper handling or storage.

- **Effects on people and housing.** People may be evacuated when a hazmat incident occurs. Relative to some of the other natural hazards assessed earlier in this LHMP, the numbers of people affected by hazmat incidents are usually less.

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- **Effects on commercial and industrial structures.** There may be economic consequences due to hazmat incidents, but the damage is generally limited to clean-up of facilities and grounds, or simply interruption of business due to evacuation.
- **Effects on infrastructure.** Hazmat incidents involving transportation may result in highway damage and downed power lines. Also, hazmat materials may impact waterways and drainage systems, and incidents can lead to the evacuation of schools, business districts, and residential areas.

Risk assessment conclusion. As a result of the historical industrial use, substantial groundwater and soil contamination is present in many locations through the City. The presence of contamination can potentially restrict future development of property and require specialized construction practices. Sites should be remediated to the level prescribed by the lead reviewing agency. Hazardous material incidents are one of the most common technological threats to public health and the environment. Incidents may occur as the result of natural disasters, human error, and/or accident.

Relationship to Other Hazards – Cascading Effects

The release of hazardous material into the environment could cause a multitude of problems. The release of explosive and highly flammable materials have caused fatalities and injuries, required large-scale evacuations, and destroyed millions of dollars worth of property. Toxic chemicals in gaseous form have caused injuries and fatalities among emergency response teams and passerby. Serious health problems have occurred where toxins have entered either surface or groundwater supplies. Releases of hazardous chemicals have been especially damaging when they have occurred in highly populated areas, or along heavily traveled transportation routes. The degree of threat posed to life and property is dependent on the type, location, and concentration of the material released, in addition to prevailing weather conditions such as precipitation, wind speed, and wind direction.

Current Hazardous Materials Goals and Policies

Emeryville’s General Plan includes the following Hazardous Materials mitigation measures.

Goals

Protection of life, natural environment, and property from natural and manmade hazards due to seismic activity, hazardous material exposure or flood damage.

Continue to identify and provide training for emergency responders in the management and mitigation of a hazardous spill incident.

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Policies

CSN-P-32. Prior to reuse, former commercial and industrial sites will be cleaned up, according to relevant State and Federal regulations.

CSN-P-33. The City will enforce regulation of local and State laws regarding the production, use, storage, and transportation of hazardous materials and waste.

CSN-P-34. The City requires abatement of lead-based paint and asbestos prior to structural renovation or demolition, and compliance with all State, Federal, Occupational Safety and Health Administration, Bay Area Air Quality Management District, Alameda County, and local rules and regulations.

CSN-P-35. Development on sites with known contamination of soil and groundwater shall be regulated to ensure that construction workers, future occupants, and the environment as a whole, are adequately protected from hazards associated with contamination.

CSN-P-36. The City supports public awareness and participation in household waste management, control, and recycling.

CSN-P-37. Siting of businesses that use, store, process, or dispose of substantial quantities of hazardous materials shall be carefully restricted in areas subject to very strong levels of ground shaking.

CSN-P-41. San Pablo Avenue, Hollis Street, and Interstate 80 will continue to serve as evacuation routes in case of emergency.

CSN-P-42. The City will continue to require minimum roadway widths to ensure access for emergency vehicles.

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4.6 Hazard: Naturally-Occurring Biological Threats

Naturally-Occurring Biological Threats risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to Emeryville.

Probability: Low	Severity: High
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Hazard Definition

Public health-related hazards may be the result of a naturally occurring event or terrorism. Key hazards of concern to Emeryville today are described below.

West Nile Virus (WNV) is a mosquito-borne virus that has been found in parts of Asia, Eastern Europe, Africa, and the Middle East. The virus arrived in the Western Hemisphere in 1999 in New York City. The more severe forms of West Nile virus are West Nile encephalitis, West Nile meningitis, and West Nile meningoencephalitis. Encephalitis refers to an inflammation of the brain, meningitis is an inflammation of the membrane around the brain and the spinal cord, and meningoencephalitis refers to inflammation of the brain and the membrane surrounding it.

Bovine Spongiform Encephalopathy (BSE) is widely referred to as "mad cow disease." It is a chronic degenerative disease that affects the central nervous system of cattle. BSE is named because of the spongy appearance of the brain tissue of infected cattle examined under a microscope. BSE belongs to a family of diseases known as the transmissible spongiform encephalopathies (TSEs). TSE animal diseases found in the United States include scrapie in sheep and goats, chronic wasting disease in deer and elk, transmissible spongiform encephalopathy in mink, feline spongiform encephalopathy in cats, and in humans: kuru, both classic and variant Creutzfeldt-Jakob disease, Gerstmann-Straussler-Scheinker syndrome, and fatal familial insomnia.

There is no evidence to date that BSE emanated from TSEs in other animals. Regarding feeding practices, it is known that cattle can become infected with BSE by eating feed contaminated with the infectious BSE agent. This is why in 1997 the U.S. Food and Drug Administration (FDA) prohibited the use of most mammalian protein in the manufacture of animal feed intended for cattle and other ruminants.

BSE is not a contagious disease. There is no evidence that the disease is transmitted through direct contact or animal-to-animal spread. The primary means by which animals become infected is through consumption of feed contaminated with the infectious BSE agent.

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Botulism is a serious paralytic illness caused by a nerve toxin that is produced by the bacterium *Clostridium botulinum*. There are three main kinds of botulism. Food borne botulism is caused by eating foods that contain the botulism toxin. Wound botulism is caused by toxin produced from a wound infected with *Clostridium botulinum*. Infant botulism is caused by consuming the spores of the botulinum bacteria, which then grow in the intestines and release toxin. All forms of botulism can be fatal and are considered medical emergencies. Food borne botulism can be especially dangerous because many people can be poisoned by eating a contaminated food.

Campylobacter jejuni (Pronounced "camp-e-low-back-ter j-june-eye") was not recognized as a cause of human food borne illness prior to 1975. Now, the bacterial organism is known to be the most common cause of food borne illness in the U.S. (*Salmonella* is the second most common cause). Food is the most common vehicle for the spread of *Campylobacter* and poultry is the most common food implicated. Some case-control studies indicate that up to 70% of sporadic cases of campylobacteriosis are associated with eating chicken. Surveys by the USDA demonstrated that up to 88% of the broiler chicken carcasses in the U.S. are contaminated with *Campylobacter* while a recent Consumer Reports study identified *Campylobacter* in 63% of more than 1000 chickens obtained in grocery stores. Other identified food vehicles include unpasteurized milk, undercooked meats, mushrooms, hamburger, cheese, pork, shellfish, and eggs.

E. coli is found in the family of bacteria named Enterobacteriaceae, which is informally referred to as the enteric bacteria. Most forms of *E. coli* are harmless; however, there are strains that cause serious illness. Other enteric bacteria are the *Salmonella* bacteria (also a very large family, with many different members), *Klebsiella pneumoniae*, and *Shigella*, which many people consider to be part of the *E. coli* family.

Hantavirus infection is caused by a group of viruses that can infect humans with two serious illnesses: hemorrhagic fever with renal syndrome (HFRS) and Hantavirus pulmonary syndrome (HPS). Hantaviruses are found without causing symptoms within various species of rodents and are passed to humans by exposure to the urine, feces, or saliva of those infected rodents. Ten different Hantaviruses have been identified as important in humans.

Hepatitis A is one of five human hepatitis viruses that primarily infect the human liver and cause human illness. The other known human hepatitis viruses are hepatitis B, C, D, and E. Hepatitis A is relatively unusual in nations with developed sanitation systems such as the U.S. Nevertheless, it continues to occur here. Each year, an estimated 100 persons die as a result of acute liver failure in the U.S. due to hepatitis A. Approximately 30 - 50,000 cases occur yearly in the U.S. and the direct and indirect costs of these cases exceed \$300 million. Hepatitis A is totally preventable, and need not occur.

Listeria monocytogenes is a pathogenic (disease-causing) bacterium that is food-borne and causes an illness called listeriosis. It is frequently overlooked as a possible cause of illness due

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to its unique growth capabilities. First, it is somewhat difficult for laboratories to grow, and when they do so, *Listeria* can be confused with common harmless contaminants and disregarded. Second, most bacteria grow poorly when temperatures fall below 40°F, while *Listeria* survives at in temperatures from below freezing (20°F) to body temperature and it grows best at 0°F to 50°F, including the temperature range that we use for refrigeration. As a result, *Listeria* may be transmitted in ready-to-eat foods that have been kept properly refrigerated.

Norwalk virus is a virus that attaches to the outside of cells lining the intestine. Once attached, it transfers its genetic material into that cell. There it reproduces, finally killing the human cell to release new copies of it that attach to more cells of the intestine's lining. Common names of the illness caused by the Norwalk and other small round structured or caliciviruses are viral gastroenteritis, acute nonbacterial gastroenteritis, food poisoning, and food borne infection. This illness occurs worldwide. Humans are the only known hosts. The viruses are passed in the stool of infected persons. Of viruses, only the common cold is reported more often than viral gastroenteritis. Norwalk and Norwalk-like viruses are increasingly being recognized as leading causes of food-borne disease in the United States. People most often get Norwalk virus infection by swallowing infected food or water. Outbreaks in the U.S. are often linked to eating raw shellfish, especially oysters and clams. Steaming does not kill the virus or prevent its transmission.

Plague is a disease caused by *Yersinia pestis* (*Y. pestis*), a bacterium found in rodents and their fleas in many areas around the world. Pneumonic plague is different from the bubonic plague. Both are caused by *Yersinia pestis*, but they are transmitted differently and their symptoms differ. Pneumonic plague can be transmitted from person to person; bubonic plague cannot. Pneumonic plague affects the lungs and is transmitted when a person breathes in *Y. pestis* particles in the air. Bubonic plague is transmitted through the bite of an infected flea or exposure to infected material through a break in the skin. Symptoms include swollen, tender lymph glands called buboes. Buboes are not present in pneumonic plague. If bubonic plague is not treated, however, the bacteria can spread through the bloodstream and infect the lungs, causing a secondary case of pneumonic plague. Patients usually have fever, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum. Nausea, vomiting, and abdominal pain may also occur. Without early treatment, pneumonic plague usually leads to respiratory failure, shock, and rapid death.

Salmonella is a type of bacteria that causes typhoid fever and many other infections of intestinal origin. Typhoid fever, rare in the U.S., is caused by a particular strain designated *Salmonella typhi*. But illness due to due to other *Salmonella* strains, just called "salmonellosis," is common in the U.S. Today, the number of known strains of this bacteria total over 2300.

SARS is a respiratory illness of unknown cause that has recently been reported in a number of countries. According to the World Health Organization (WHO), the main symptoms and signs

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of SARS include a fever greater than 100.5° F (38° C), and cough, shortness of breath, or difficulty breathing. The cause of SARS is not known at this time. Researchers at CDC and around the world are working to find the cause of SARS. At this early stage of the investigation, it seems more likely that SARS is caused by an organism that we have less experience with rather than a commonly occurring, known organism.

Shigella germ is a bacterium that can cause sudden and severe diarrhea (gastroenteritis) in humans. Shigella lives in the human intestine and is commonly spread both through food and by person-to-person contact. The illness is also known as "bacillary dysentery." About 25,000 or so laboratory confirmed cases of shigellosis are reported each year in the U.S. However, many cases go undiagnosed and/or unreported, and the best estimates are that 450,000 cases of Shigella infection actually occur annually in the U.S.

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*, which most commonly affects the lungs (pulmonary TB) but can also affect the central nervous system (meningitis), lymphatic system, circulatory system (miliary tuberculosis), genitourinary system, bones and joints. Tuberculosis is one of the top four infectious killing diseases in the world and most common major infectious diseases today.

Tularemia is a potentially serious illness that occurs naturally in the U.S. It is caused by the bacterium *Francisella tularensis* found in animals (especially rodents, rabbits, and hares). Tularemia is also known as "rabbit fever." Tularemia is usually a rural disease and has been reported in all U.S. states except Hawaii. Tularemia is a widespread disease in animals. About 200 human cases of tularemia are reported each year in the U.S. Most cases occur in the south-central and western states.

Canine Distemper is a viral disease of young dogs characterized by high fever and respiratory inflammation. It can affect wild animals and City pets. Other animal diseases which can affect humans include rabies and toxoplasmosis (an opportunistic infection caused by the microscopic parasite *Toxoplasma gondii*, found in raw or undercooked meat and cat feces), as well as parasites such as roundworms, whipworms, hookworms, ringworms, and mange.

Exotic Newcastle Disease (END) is a contagious viral disease affecting many species of birds including poultry and wild birds. This is probably one of the most infectious diseases of poultry in the world with a death rate of almost 100 percent in unvaccinated poultry flocks and so virulent that many birds die without showing any clinical signs. The disease can even infect and cause death in vaccinated poultry.

END is extremely contagious. The spread is primarily through direct contact between healthy birds and the bodily fluids of infected birds. It can be transmitted through infected bird droppings as well as secretions from the nose, mouth and eyes. It spreads rapidly among confined birds...like commercially raised chickens. The disease is also easily spread by virus-bearing material picked up on shoes and clothing and carried from an infected flock to a

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healthy one. END can also spread from poultry flocks to wildlife as wild birds come into contact with infected poultry, possibly when wild birds enter a pen to feed on spilled grain. Although experiments have documented that several wild species including ducks and pheasants can develop the disease, widespread illness and death has only been documented in double-crested cormorants in the United States and Canada. This disease affects the respiratory, nervous and digestive systems, with an incubation period ranging from two to 15 days.

The available information suggests that Newcastle disease can affect people; however, it does not pose a significant health risk. In humans, the disease is usually limited to conjunctivitis, which is a mild inflammation of the tissues around the eyes and is seen in persons associated with infected birds or facilities where infected birds are housed. It should be noted that poultry products in the Arizona marketplace, including eggs and meat, continue to be safe to consume.

History

According to the Centers for Disease Control and Prevention (CDC) there have been 272 cases (resulting in six fatalities) of West Nile Virus activity throughout California including one reported case in Alameda County.

Risk Assessment

Given the existence of naturally occurring biological agents in Emeryville, without enhanced public outreach, monitoring and control, the potential exists for one or more of these virulent diseases to dramatically affect the life, health and safety of City citizens.

- **Effects on people and housing.** Humans are susceptible to the effects of most naturally-occurring biological threats.

Risk assessment conclusion. Because the risk for a pandemic outbreak of a lethal disease does exist, preparedness should be maintained at a high level.

Current Naturally-Occurring Biological Threats Goals

Following is the City of Emeryville’s Naturally-Occurring Biological Threat mitigation measures.

Goals

Continue to identify and provide training for emergency responders in the management and mitigation of a biological threat incident.

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4.7 Hazard: Terrorism

Terrorism risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to Emeryville.

Probability: Medium	Severity: High
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Hazard Definition

Terrorism is defined in 28 CFR Section 0.85) as “...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.” Since September 11, 2001, terrorism has become a fact of life for all Americans. Planning for response to potential terrorist incidents has long been part of California’s Emergency Preparedness Planning effort. California provides a target-rich environment for terrorists, with many facilities and venues and an easy place to hide in California’s diverse population. Effective hazard mitigation that reduces risk to terrorism must be based upon technical expert information and analysis of actual terrorist events.

Terrorists often use threats to create fear among the public, to try to convince citizens that their government is powerless to prevent terrorism, and to get immediate publicity for their causes. Terrorist acts or acts of war may cause casualties, extensive property damage, fires, flooding, and other ensuing hazards.

The FBI defines a terrorist incident as a violent act or an act dangerous to human life aimed at intimidating or coercing a government or the civilian population in pursuit of political or social aims. In tracking these attacks, it breaks them down in two broad categories — international and domestic terrorism. Among domestic terrorists, the Animal Liberation Front, the Earth Liberation Front and other militant animal-rights and environmental groups — categorized as special interest domestic terrorists — have been involved in the greatest number of incidents in the past decade. But none of their actions have resulted in injuries or death. Terrorism takes many forms, including:

Chemical. Chemical weapons have been used primarily to terrorize an unprotected civilian population and not as a weapon of war. This is because of fear of retaliation and the likelihood that the agent would contaminate the battlefield for a long period of time.

Some analysts suggest that the possibility of a chemical attack would appear far more likely than either the use of nuclear or biological materials, largely due to the easy availability of many of the necessary precursor substances needed to construct chemical weapons. Additionally, the rudimentary technical knowledge needed to build a working chemical device

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is taught in every college level chemistry course in the world. Some chemical agents are odorless and tasteless and are difficult to detect. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days).

A terrorist would not have to build a complicated chemical release device. During favorable weather conditions an already existing chemical plant could be sabotaged or bombed releasing a toxic cloud to drift into a populated area. The result could be just as dangerous as having placed a smaller chemical device in a more confined space. This type of incident would cause the maximum amount of fear, trepidation, and potential panic among the civilian population, and thus achieve a major terrorist objective.

Biological. Biological weapons are defined as any infectious agent such as a bacteria or virus used to produce illness or death in people, animals, or plants. This definition is often expanded to include biologically-derived toxins and poisons. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water because the agents are extremely difficult to detect. The agents are cheap, easy to make, and simple to conceal. Even small amounts, if effectively deployed, could cause massive injuries and overwhelm emergency rooms. The production of biological weapons can be carried out virtually anywhere — in simple laboratories, on a farm, or even in a home.

However, experts say it remains very difficult to transform a deadly virus or bacterium into a weapon that can be effectively dispersed. A bomb carrying a biological agent would likely destroy the germ as it explodes. Dispersing the agents with aerosols is challenging because biomaterials are often wet and can clog sprayers. Most agree that, while a biological attack could be devastating in theory, in reality, the logistical challenges of developing effective agents and then dispersing them makes it less likely a terrorist could carry out a successful widespread assault.

Radiological. A radioactive material is a material made up of unstable atoms which give off excess energy in the form of radiation through the process of radioactive decay. Radiation cannot be detected by human senses. Wherever radioactive materials are used, transported, or stored there is a potential for a radiological accident to occur. Under extreme circumstances an accident or intentional explosion involving radiological materials can cause very serious problems. Consequences may include death, severe health risks to the public, damage to the environment, and extraordinary loss of, or damage to, property. Some of their most common uses include use:

- by doctors to detect and treat serious diseases
- by educational institutions and companies for research
- by the military to power large ships and submarines
- by companies in the manufacture of products
- as a critical base material to help produce the commercial electrical power that is generated by a nuclear power plant

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- as one of the critical components in nuclear weapons, which are relied upon to help deter the threat of war

Nuclear. The possibility exists that a terrorist organization might acquire the capability of creating a small nuclear detonation. A single nuclear detonation in the United States would likely produce fallout affecting an area many times greater than that of the blast itself. There is also the possibility that a terrorist will construct a “dirty bomb”, a bomb that is used to distribute nuclear contaminated materials. It would have less of an effect than a “traditional” nuclear bomb, but the terror effect on the population would be great.

Explosive. The possibility exists that a terrorist may attack with conventional explosives, particular in a public setting. Innumerable incidents have occurred around the world involving car bombs, truck bombs, and bombs attached directly to terrorist individuals. Explosive terrorist attacks may have consequences including death and damage to property.

Cyber-terrorism. Cyber-terrorism is the use of computer network tools to shut down critical government infrastructures such as energy, transportation, and government operations, or to coerce or intimidate a government or civilian population. The premise of cyber-terrorism is that as nations and critical infrastructure became more dependent on computer networks for their operation, new vulnerabilities are created. A hostile nation or group could exploit these vulnerabilities to penetrate a poorly secured computer network and disrupt or even shut down critical public or business operations.

The goal of cyber-terrorism is believed to be aimed at hurting the economy of a region or country, and to amplify the effects of a traditional physical terrorist attack by causing additional confusion and panic.

History

On August 28, 2003, an improvised explosive device (IED) was detonated near the front door of Chiron Life Science Center in Emeryville causing damage to the building. A second device detonated in another Chiron building shortly after first responders arrived at the scene, also damaging the building and the surrounding area. Chiron had previously received harassing e-mails, telephone calls, and faxes, and some Chiron employees had been harassed at their residences. Chiron, an animal testing laboratory, is associated with Huntingdon Life Sciences (HLS). HLS, and individuals and companies associated with it, have regularly been targeted by animal rights extremists.

According to the Federal Bureau of Investigation’s report on terrorist attack there have been six terrorist incidents in Emeryville or within a 40 mile radius of Emeryville as noted in the following table.

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Date	Location	Incident Type	Group	Group Type	Death/Injuries
08/28/2003	Emeryville	Bombing	Animal Rights Extremist Group	Domestic Terrorism, Special Interest	
09/26/2003	Pleasanton	Bombing	Animal Rights Extremist Group	Domestic Terrorism, Special Interest	
01/15/2000	Petaluma	Incendiary Attack	Animal Liberation Front	Domestic Terrorism, Special Interest	
01/03/2000	Petaluma	Incendiary Attack	Animal Liberation Front	Domestic Terrorism, Special Interest	
01/26/1981	San Francisco	Bombing	Jewish Defense League/American Revenge Committee	Domestic Terrorism, Right Wing	
08/20/1980	Berkeley	Pipe Bombing	Iranian Free Army	International Terrorism, Foreign Terrorist Group	2 injured

Source: Federal Bureau of Investigation

Risk Assessment

Many terrorist events have occurred in California. The majority of these incidents have been bombings. However, there is also a concern for the potential of Weapons of Mass Destruction (WMD) use in future terrorist events. The use of WMDs increases the potential for mass casualties and damage.

One of the special considerations in dealing with the terrorist threat is that it is difficult to predict. One must know the minds and capabilities of various terrorists and terrorist groups. These are characteristics terrorist organizations strive to conceal. Because all terrorists are not the same, the calculation is even more difficult. Two things are clear from the perspective of hazard mitigation: the most often used weapon of terrorists is bombs and the greatest potential for loss is from WMDs.

Because of the dynamic nature of the terrorist threat and the open nature of California society, all jurisdictions within California are vulnerable to terrorist attack.

- **Effects on people, economics, housing commercial and industrial structures.** Depending on levels of contamination and exposure, effects could range from minimal to devastating.
- **Effects on infrastructure.** Nuclear, radiological, and cyber-terrorism can have profound effects on infrastructure.

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Risk assessment conclusion. Due to events such as the September 11 attack and the declared war against terrorism, national and local governments have assigned high priority to terrorist attack preparedness.

Current Terrorism Threat Goals and Plans

Following are the City of Emeryville's Terrorism Threat mitigation measures.

Goals

Continue to identify and provide training for emergency responders in the management and mitigation of a terrorism threat incident.

Plans

Continue participation in the regional Joint Terrorism Tasks Forces.

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5. Goals, Objectives and Mitigation Strategies

The City of Emeryville’s Hazard Mitigation Working Group held a workshop to review and analyze the risks assessments. The Working Group developed goals, objectives and mitigation strategies based on the risks assessment studies and selected those that were determined to be of greatest benefit in hazard reduction to the City. The hazard mitigation strategies for the City of Emeryville are as follows:

GOALS / OBJECTIVES/ MITIGATION	HAZARDS
Earthquake	
Goal	To mitigate access issues and improve survivability
Objective 1	Develop a plan to under-ground utilities
Objective 2	Incentive program to retrofit commercial properties
Objective 3	Business interruption planning and preparedness
Objective 4	Work with schools to enhance school-safe programs
Objective 5	Retrofit public buildings that are housing essential services
Objective 6	Incentive program to install seismic valves for water mains and natural gas pipelines at commercial and multi-family properties
Objective 7	Incentive program for sprinkler retrofit
Objective 8	Incentive program to retrofit homes
Objective 9	Pre-positioning of emergency supplies (i.e., near campuses)
Objective 10	Retrofit high school gym
Flooding	
Goal	Reduce possibility of damage and loss due to flooding
Objective 1	Reconfigure drainage at Powell and Watergate (peninsula) where police station and a fire station are located <ul style="list-style-type: none"> a. construct a bioswale to drain Powell Street to the Bay
Wildfire	
Goal	Reduce impact of wildland fire
Objective 1	Institute an aggressive vegetation management program at East Shore State Park (big risk is smoke moving over Interstate 80 during a wildfire event)

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GOALS / OBJECTIVES/ MITIGATION	HAZARDS
Extreme Weather	
Goal	Minimize the impact of an extreme weather event (specifically high winds incidents)
Objective 1	Develop a plan to under-ground utilities
Objective 2	Develop an aggressive tree-trimming program
Hazardous Materials	
Goal	Minimize the impact of a hazardous materials incident
Objective 1	Pursue changes to rail side-lining of tankers/cars carrying hazardous materials
Objective 2	Accelerate remediation of sites containing hazardous materials
Objective 3	Develop GIS based system that maps hazardous pipelines
Naturally Occurring Biological Threats	
Goal	Increase detection, preparedness and responsiveness to potential biological threats
Objective 1	Develop vaccination programs for public schools and emergency responders
Terrorism	
Goal	Increase deterrence and prevention measures
Objective 1	Install security cameras around rail-siding

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6. Action Plan

The process used to prioritize mitigation strategies involved lengthy discussions with various stakeholders, followed by citizen and community review. The end result is a hazard mitigation Action Plan with a prioritized list of strategies that the City of Emeryville expects to carry out during the next five (5) years.

Prioritizing Strategies

The process used was to first prioritize goals and their respective objectives based on priority maps created during the risk assessments. Available resources and public input were also considered. The City of Emeryville next assessed each strategy listed under the prioritized list of goals. The City then prepared a draft Action Plan that listed goals followed by a prioritized list of strategies.

In assessing and evaluating each strategy, the City considered the following factors:

1. The cost was justified
2. Financial resources were available; local or outside resources
3. Staff resources were adequate
4. Minimal impact on City departmental functions
5. Strategies mitigate risks for the riskiest hazard events
6. Strategies reflect the goals and objectives

Implementation/Administration

The Action Plan includes the principal contact and cooperating parties, timeframe and estimated cost and/or resource involved in carrying out the strategy. The use of FEMA's Benefit-Cost Analysis (BCA) software (FEMA Mitigation BCA Toolkit CD Version 3.0) will be used to identify the cost-effectiveness of each activity/project undertaken.

Each year the Action Plan will be revisited and the first year will be dropped as those activities are completed and another year will be added so that the Action Plan always reflects a five-year timeframe and remains current. Strategies undertaken and completed will be evaluated as to their effectiveness.

For the planning areas subject to flood hazards, the mitigation actions and projects that reduce flood risk and deal with repetitive loss structures will be in compliance with the NFIP. Those activities not completed during the first year will be re-evaluated and included in the first year of the new Action Plan if still appropriate.

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Even though individual strategies will be assigned a principal contact to ensure implementation, overall responsibility, oversight, and the general monitoring of the Action Plan has been assigned to the City of Emeryville's Economic Development & Housing Department who will provide periodic updates to the City Council.

This Action Plan serves as a guide to spending priorities but will be adjusted annually to reflect current needs and financial resources. Some Plans will require outside funding for implementation. If outside funding is not available, then the Plan will be set aside until new sources of funding can be identified.

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Hazard	Goal / Strategy	Mitigation Action	Priority	Responsible Party	Timeframe / Schedule	Cost / Resources
Earthquake	To mitigate access issues and improve survivability	Develop a plan to underground utilities	1	Director Public Works	12 months after FEMA funding approved	\$100,000 FEMA
Extreme Weather	Minimize the impact of an extreme weather event (specifically high winds incidents)	Develop a plan to underground utilities	1	Director Public Works	12 months after FEMA funding approved	\$100,000 FEMA
Earthquake	To mitigate access issues and improve survivability	Incentive program to retrofit commercial properties	2	Chief Building Official/ Director Economic Development & Housing	12 months after FEMA funding approved	\$100,000 FEMA
Flooding	Reduce possibility of damage and loss due to flooding	Reconfigure drainage at Powell and Watergate (peninsula) where a police station and fire station are located a. construct a bioswale to drain Powell Street to the Bay	2	Director Public Works	6-12 months after FEMA funding approved	\$100,000 FEMA
Earthquake	To mitigate access issues and improve survivability	Business interruption planning and preparedness	3	Chief Fire Department	12 months after FEMA funding approved	\$100,000 FEMA
Earthquake	To mitigate access issues and improve survivability	Work with schools to enhance school-safe programs	3	Chief Fire Department/ Chief Police Department	12 months after FEMA funding approved	\$200,000 FEMA
Earthquake	To mitigate access issues and improve survivability	Retrofit public buildings that are housing essential services	3	Director Public Works/ Chief Building Official/ Chief Fire Department	5 years after FEMA funding approved	\$5 - \$10 Million FEMA

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Hazard	Goal / Strategy	Mitigation Action	Priority	Responsible Party	Timeframe / Schedule	Cost / Resources
Earthquake	To mitigate access issues and improve survivability	Incentive program to install seismic valves for water mains and natural gas pipelines at commercial and multi-family properties	3	Chief Building Official/ Director Economic Development & Housing	TBD	\$100,000 FEMA
Earthquake	To mitigate access issues and improve survivability	Incentive program for sprinkler retrofit	3	Chief Fire Department/ Director Economic Development & Housing	12 months after FEMA funding approved	\$20 Million FEMA
Earthquake	To mitigate access issues and improve survivability	Incentive program to retrofit homes	4	Chief Building Official/ Director Economic Development & Housing	12 months after FEMA funding approved	\$50,000 FEMA
Earthquake	To mitigate access issues and improve survivability	Pre-positioning of emergency supplies (i.e., near campuses)	4	Chief Fire Department	6 – 12 months after FEMA funding approved	\$50,000 FEMA
Earthquake	Increase deterrence and prevention measures	Retrofit high school gym	4	Director Economic Development & Housing	TBD	\$600,000 FEMA
Extreme Weather	Minimize the impact of an extreme weather event (specifically high winds incidents)	Develop an aggressive tree-trimming program	4	Director Public Works	Ongoing	\$20,000 to \$30,000 per year FEMA
Terrorism	Increase deterrence and prevention measures	Install security cameras around rail-siding	4	Chief Police Department	12 months after FEMA funding approved	\$100,000 FEMA

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7. Assets at Risk

**List of the City of Emeryville’s Assets at Risk (existing buildings, infrastructure, and critical facilities)
for All Applicable Hazards**
(Including Location and Potential Dollar Losses)

Methodology used to prepare estimates: Assessor’s values, replacement costs, insurance coverage, estimated costs based on recent construction procurements and/or local standard construction costs per square foot. *Road damage estimates are based on a per site cost figure, with each site covering an estimate road length of 2 to 300 feet. Each road may experience multiple damaged sites from one hazard event, or multiple roads may experience one event each. There is no way to make an accurate estimate of the potential limits one hazard may cause. % denotes the approximate damage/loss to the identified asset as a result of each relevant hazard. The method used to establish each % was to logically assess the practical extent of loss or damage to each asset as balanced by the vulnerability of the asset to each hazard.

Type	Name	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Wildfire	Extreme Weather	Hazardous Materials	Biological Threats	Terrorism
Government	Child Development Center	37.83654	-122.28532	\$ 2,103,188	\$ 193,733	75%	25%	0%	0%	20%	0%	0%
Government	Civic Center	37.83099	-122.28542	\$ 7,038,387	\$ 786,033	75%	25%	0%	0%	20%	0%	0%
Government	Civic Center – Old Town	37.83099	-122.28542	\$ 2,258,044	\$ 54,135	75%	25%	0%	0%	20%	0%	0%
Government	Civic Center II Expansion (vacant)	37.83051	-122.28530	\$ 4,177,381	n/a	75%	25%	0%	0%	20%	0%	0%
Government	Vets Memorial/Senior Center	37.83440	-122.27958	\$ 3,166,067	\$ 225,831	75%	25%	0%	0%	20%	0%	0%
Government	Public Works Corporate Yard	37.83734	-122.29086	\$ 3,897,577	\$ 107,453	75%	25%	0%	0%	20%	0%	0%
Government	Recreation Department	37.83326	-122.28025	\$ 738,178	\$ 22,191	75%	25%	0%	0%	20%	0%	0%
Government	Marina Restroom	37.83955	-122.29292	\$ 318,215	\$ 2,422	75%	25%	10%	0%	0%	0%	0%
Government	Doyle Hollis Park Restroom	37.8431	-122.2893	\$ 350,000	n/a	75%	0%	0%	0%	0%	0%	0%
Government	Marina – Emeryville Pier	37.83998	-122.3092	\$ 250,667	n/a	75%	25%	10%	0%	0%	0%	0%
Emergency	Fire Station #2	37.84397	-122.29064	\$ 1,613,069	\$ 158,223	75%	25%	0%	0%	20%	0%	10%
Emergency	Fire Station #2 Bio-Storage	37.84397	-122.29064	\$ 529,287	\$ 118,709	75%	25%	0%	0%	50%	0%	10%
Emergency	Peninsula Fire Station	37.83714	-122.30063	\$ 2,071,608	\$ 156,051	75%	25%	25%	0%	20%	0%	10%

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Type	Name	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Wildfire	Extreme Weather	Hazardous Materials	Biological Threats	Terrorism
Emergency	Police Station	37.83716	-122.30190	\$ 3,090,069	\$ 664,665	75%	0%	0%	0%	0%	0%	10%
School	Emeryville High School – Pool	37.83564	-122.28123	\$ 321,011	n/a	75%	0%	0%	0%	0%	20%	0%
School	Grace Smith Elementary School	33.24130	-115.52945	\$ 5,000,000	\$ 1,000,000	75%	25%	0%	0%	0%	20%	0%
Equipment	Contractor's Equipment - Various Locations	37.83817	-122.29638	n/a	\$ 71,000	75%	25%	10%	10%	10%	0%	0%
Vehicles	Various Locations	37.83817	-122.29638	n/a	\$ 3,378,500	25%	25%	10%	10%	10%	0%	0%
Public Art Installations	Public Art – Various Locations	37.83817	-122.29638	n/a	\$ 452,393	75%	25%	10%	10%	10%	0%	0%
Road	36 th Street	37.82665	-122.27657	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	37 th Street	37.82715	-122.27489	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	39 th Street	37.83013	-122.27568	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	40 th Street	37.83073	-122.28110	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	41 st Street	37.83177	-122.27507	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	43 rd Street	37.83346	-122.27588	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	45 th Street	37.83486	-122.27972	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	47 th Street	37.83652	-122.27683	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	48 th Street	37.83658	-122.28027	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	53 rd Street	37.83742	-122.27931	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	54 th Street	37.83830	-122.27798	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	55 th Street	37.83898	-122.27813	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	59 th Street	37.84240	-122.28125	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	61 st Street	37.84437	-122.28076	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	62 nd Street	37.84527	-122.28267	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	63 rd Street	37.84564	-122.28464	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	64 th Street	37.84479	-122.29089	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	65 th Street	37.84698	-122.29050	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	66 th Street	37.84838	-122.28909	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	67 th Street	37.84951	-122.28894	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	Apgar Street	37.82901	-122.27440	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	Bay Street	37.84664	-122.29472	\$ 500K per site*	n/a	100%	0%	0%	0%	0%	0%	0%
Road	Beaudry Street	37.84005	-122.28656	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%

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Type	Name	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Wildfire	Extreme Weather	Hazardous Materials	Biological Threats	Terrorism
Road	Christie Avenue	37.84168	-122.29512	\$ 500K per site*	n/a	90%	25%	0%	0%	0%	0%	0%
Road	Doyle Street	37.83982	-122.28743	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	Emery Street	37.83130	-122.28120	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Essex Street	37.83508	-122.27864	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Frontage Road	37.83786	-122.29722	\$ 500K per site*	n/a	105%	25%	0%	0%	0%	0%	0%
Road	Halleck Street	37.83030	-122.29022	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Harlan Street	37.83027	-122.28325	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Haruff Street	37.83890	-122.28992	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Haven Street	37.82685	-122.28334	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Holden Street	37.83097	-122.28694	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Hollis Street	37.83724	-122.28816	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Horton Street	37.83515	-122.28968	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Hubbard Street	37.83053	-122.28908	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Lacoste Street	37.83818	-122.29639	\$ 500K per site*	n/a	90%	25%	0%	0%	0%	0%	0%
Road	Ocean Avenue	37.84649	-122.28772	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	Overland Avenue	37.84327	-122.29303	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	Park Avenue	37.83119	-122.28586	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Peabody Lane	37.84714	-122.28704	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	Peladeau Street	37.83937	-122.29002	\$ 500K per site*	n/a	75%	0%	0%	0%	0%	0%	0%
Road	Powell Street	37.83717	-122.30191	\$ 500K per site*	n/a	100%	25%	0%	0%	0%	0%	0%
Road	Salem Street	37.83658	-122.28027	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Shellmound Street	37.83870	-122.29324	\$ 500K per site*	n/a	100%	25%	0%	0%	0%	0%	0%
Road	Shellmound Way	37.83929	-122.29429	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Stanford Avenue	37.84132	-122.28180	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Vallejo Street	37.84333	-122.28673	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Watts Street	37.83059	-122.28221	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Road	Yerba Buena Avenue	37.82968	-122.28074	\$ 500K per site*	n/a	75%	25%	0%	0%	0%	0%	0%
Storm Drain System	Citywide (Storm Drain Collection System)			\$15,000*	n/a	75%	25%	0%	0%	0%	0%	0%
Sanitary Sewer System	Citywide (Sanitary Sewer Collection System)			\$15,000*	n/a	75%	25%	0%	0%	0%	0%	0%

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City of Emeryville’s Future Buildings, Infrastructure, and Critical Facilities Projects

Following is a current list of the planned new building and infrastructure projects for the City of Emeryville.

- Park at Doyle Street (currently under construction – official name TBD)
- Greenway at 59th Street
- South Bayfront Pedestrian / Bicycle Bridge
- I-80 Pedestrian / Bicycle Bridge
- Emeryville Center of Community Life (community center in conjunction with school district)

How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure

The table below cross references the mitigation Action Plans identified and how they address reducing the effects of hazards to existing and future buildings and infrastructure.

City of Emeryville	Existing			Future	
	Government/ Emergency Structures	Public Facility Structures	Infrastructure	Public Facility Structures	Infrastructure
<p>Earthquake Goal 1: To mitigate access issues and improve survivability</p> <p><i>Earthquake Mitigation Action Plan:</i></p> <ul style="list-style-type: none"> a) Develop a plan to under-ground utilities b) Incentive program to retrofit commercial properties c) Business interruption planning and preparedness d) Work with schools to enhance school-safe programs e) Retrofit public buildings that are housing essential services f) Incentive program to install seismic valves for water mains and natural gas pipelines at commercial and multi-family properties g) Incentive program for sprinkler retrofit h) Incentive program to retrofit homes i) Pre-positioning of emergency supplies (i.e., near campuses) j) Retrofit high school gym 	X	X	X	X	X

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City of Emeryville	Existing			Future	
	Government/ Emergency Structures	Public Facility Structures	Infrastructure	Public Facility Structures	Infrastructure
<p>Flooding Goal 1: Reduce possibility of damage and loss due to flooding.</p> <p><i>Flooding Mitigation Action Plan:</i></p> <p>a. Reconfigure drainage at Powell and Watergate (peninsula) where a police station and fire station are located</p> <p>- Construct a bioswale to drain Powell Street to the Bay</p>	X	X	X	X	X
<p>Extreme Weather Goal 1: Minimize the impact of an extreme weather event (Specifically high winds incidents)</p> <p><i>Extreme Weather Mitigation Action Plan:</i></p> <p>a) Develop a plan to under-ground utilities</p> <p>b) Develop an aggressive tree-trimming program</p>	X	X	X	X	X
<p>Terrorism Goal 1: Increase deterrence and prevention measures.</p> <p><i>Terrorism Mitigation Action Plan:</i></p> <p>a) Install security cameras around rail-siding</p>	X	X	X	X	X

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8. Plan Maintenance

Because the Local Hazard Mitigation Plan is a living document that reflects the City of Emeryville's ongoing hazard mitigation activities, the process of monitoring, evaluating, and updating it will be critical to the effectiveness of hazard mitigation in the City.

Emeryville's Economic Development & Housing Department has the responsibility for maintaining, evaluating, monitoring, and updating the LHMP. The Economic Development & Housing Department has developed a method to ensure that regular reviews and updates occur. FEMA regulations require an update every five years. The City will utilize the Hazard Mitigation Working Group to poll agencies to see if they want to continue to participate and if their elements of the LHMP are up-to-date.

Factors that will be considered in evaluating whether an update or revisions are required will include:

- Relevance of LHMP goals and objectives to the evolving situation in Emeryville (i.e., significant changes in the landscape due to implementation of hazard mitigation projects).
- Consistency of LHMP goals and objectives with changes in state and federal laws, regulations or policies.
- Relevance of LHMP goals and objectives to current and expected conditions.
- New technologies.
- New information.

The risk assessment portion of the LHMP will be reviewed to determine if the information should be updated or modified. The parties responsible for the various implementation actions will report on:

- Status of their projects.
- Implementation processes that worked well.
- Any difficulties encountered.
- How coordination efforts are proceeding.
- Which strategies should be revised.

Emeryville is committed to involving the public in the continual reshaping and updating of the LHMP. The Hazard Mitigation Working Group members are responsible for the annual review and update of the LHMP. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the LHMP.

Emeryville currently uses comprehensive land use planning, capital improvements planning, and building codes to guide and control development within the City. The hazard mitigation strategies of the City's General Plans and specifically the Safety element have been integrated

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into this LHMP. This LHMP will be provided to those responsible for the City's General Plan development and update mechanisms to insure that consistency is maintained.

Emeryville has initiated a comprehensive update to its General Plan. This update is currently underway and is expected to be completed in 2009. This LHMP will serve as an important document in the General Plan update processes particularly as it relates to the seismic, safety and other related elements.

Copies of the Local Hazard Mitigation Plan will be kept on hand at Emeryville's Economic Development & Housing Department. These copies will include the address and phone number of the City's staff member responsible for tracking public comment.