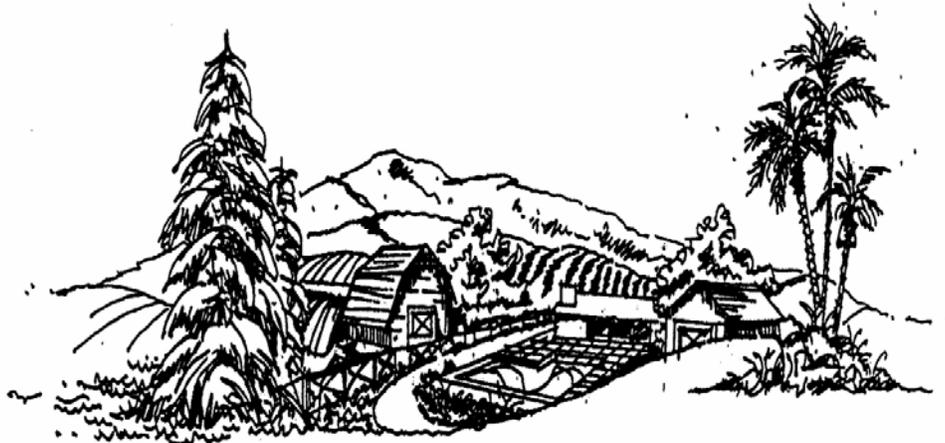


NATURAL HAZARD MITIGATION PLAN

BRADBURY, CALIFORNIA



Adopted October 19, 2004

Natural Hazard Mitigation Plan (NHMP)

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Forword

The City of Bradbury is proud to present this Natural Hazard Mitigation Plan (NHMP). The plan focuses on defining natural Hazard affecting the City of Bradbury. It assesses ongoing hazard mitigation activities, evaluates mitigation measures that could be implemented and establishes a strategy for updating hazard mitigation programs. This plan should be considered a living and a dynamic document subject to periodic revision as the needs of the City of Bradbury change over time.

We appreciate the participation of local residents, representatives of public safety agencies and infrastructure purveyors. We also want to thank the Disaster Management Area Coordinators and the following list of individuals and agencies for their input in developing this plan.

- City of Bradbury Building and Safety Department - Willdan, 13191 Crossroads Parkway North, Suite 405, Industry, California 91746-3497
- City of Bradbury Emergency Services Coordinator/Public Information Officer
- City of Bradbury Finance Division
- City of Bradbury Planning Department
- City of Bradbury Public Works Department – County of Los Angeles Roads Division
- Disaster Management Area Coordinators
- City of Bradbury Fire Department – County of Los Angeles Fire Department
- City of Bradbury Police Department – County of Los Angeles Sheriff’s Department
- Utility Companies –Water, Electrical, Telephone, Gas, Cable Television

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1.0 EXECUTIVE SUMMARY

1.1 Setting

The City of Bradbury is located in the foothills of the San Gabriel Mountains, in the northeastern section of Los Angeles County. The City is bounded on the north by the Angeles National Forest, on the west by the City of Monrovia, and on the east and south by the City of Duarte. Bradbury is approximately 1 mile north of the Interstate-210 freeway and less than a mile north of the terminus of the Interstate-605 freeway (Refer to Exhibits 1 and 2).

1.2 Five -Year Action Plan Matrix

The City of Bradbury Natural Hazard Mitigation Action Plan includes resources and information to assist City residents, public and private sector organizations, and others interested in participating in planning activities that will be implemented in the event the City experiences a natural disaster. The mitigation plan provides a list of activities that may assist City of Bradbury in reducing risk and preventing loss from future natural hazard events. The action items address multi-hazard issues that include but are not limited to earthquakes, earth movements, flooding, wildfires and windstorms.

1.3 How the Plan is Organized

The Mitigation Plan contains a five-year action plan matrix, background on the purpose and methodology used to develop the mitigation plan, a profile of City of Bradbury and a list of six natural Hazard that could occur within the City. The appendices contain supporting information and material and reporting forms.

1.4 Who Participated in Developing the Plan?

The City of Bradbury Natural Hazard Mitigation Action Plan is the result of a collaborative effort between City of Bradbury's citizens, public agencies, various local organizations, and regional and state organizations. Public participation played a key role in development of goals and action items. Interviews were conducted with stakeholders across the City, and two public workshops were held to include City of Bradbury residents in plan development. A project Steering Committee guided the process of developing the plan.

The Steering Committee was comprised of representatives from the Disaster Management Area Coordinators that included:

- City of Bradbury Building and Safety Department
- City of Bradbury Emergency Services Coordinator/Public Information Officer
- City of Bradbury Finance Department
- City of Bradbury Planning Department
- County of Los Angeles Roads Division

1.5 Mission

The mission of the City of Bradbury Natural Hazard Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural Hazard. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss-prevention, and identifying activities to guide the City towards building a safer, more sustainable community.

1.6 Goals

The plan's goals describe the overall direction that City of Bradbury agencies, organizations, and citizens can take to work toward mitigating risk from natural Hazard. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations outlined in the action items.

Protect Life and Property

- Implement activities that assist in protecting lives by making homes, infrastructure, critical facilities, and other property more resistant to losses from natural Hazard.
- Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic Hazard.
- Improve hazard assessment information to make recommendations for discouraging new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural Hazard.

Public Awareness

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural Hazard.
- Provide information regarding tools; partnership opportunities, and funding resources to assist in implementing mitigation activities.

Natural Systems

- Balance natural resource management and land use planning with natural hazard mitigation to protect life, property, and the environment.
- Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions.

Partnerships and Implementation

- Strengthen communication and coordinate participation among and within public agencies, citizens and local organizations to gain a vested interest in implementation activities.
- Encourage leadership within public and private sector organizations to prioritize and implement local and regional hazard mitigation activities.

Emergency Services

- Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.
- Strengthen emergency operations by increasing collaboration and coordination among public agencies, local organizations.
- Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

1.7 Organization of Action Items

The action items are a listing of activities in which City agencies and citizens can engage to reduce risk. Each action item includes an estimate of the time line for implementation. Short-term action items are activities that City agencies may implement using existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take five or more years to implement.

The action items lists all of the multi-hazard and hazard-specific action items included in the mitigation plan. The data collection, research and the public participation process resulted in the development of the mitigation activities listed in Appendix A. The mitigation activities include the following information for each of the action items:

Coordinating Organization. The coordinating organization is the public agency with regulatory responsibility to address natural Hazard, or that agency willing and able to organize resources, find appropriate funding, or oversee implementation activities, monitoring, and evaluation. Coordinating organizations may include local, county, or regional agencies that are capable of or may be responsible for implementing activities and programs.

Time line. Action items include both short and long-term activities. Each action item includes an estimate of the time for implementation. Short-term action items are activities, which the City of Bradbury is capable of implementing using existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take five or more years to implement.

Ideas for Implementation. Each action item includes ideas for implementation and potential resources which may include financial grant programs or human resources.

Plan Goals Addressed. The plan's goals addressed by each action item are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins. The plan goals are organized into the following five areas:

- Protect Life and Property
- Public Awareness
- Natural Systems
- Partnerships and Implementation
- Emergency Services

Partner Organizations. The Partner organizations are not listed with the individual action items or in the plan matrix. Partner organizations are listed in Appendix A of this

plan and are agencies or public/private sector organizations that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization. The partner organizations listed in the Resource Directory of the City of Bradbury Natural Hazard Mitigation Plan are potential partners recommended by the project steering committee, but were not necessarily contacted during the development of the Mitigation Plan. Partner organizations should be contacted by the coordinating organization to establish commitment of time and resources to action items.

Constraints. Constraints may apply to some of the action items. These constraints may be a lack of city staff, lack of funds, or vested property rights, which might expose the City to legal action as a result of adverse impacts on private property.

1.8 Plan Implementation, Monitoring, and Evaluation

The Plan Maintenance (Section 6) of this document details the formal process that will ensure that the City of Bradbury Natural Hazard Mitigation Plan remains an active and relevant document. The Plan's maintenance process includes a schedule for monitoring and evaluating it annually and producing a Plan revision every five years. Section 6 also describes how the City of Bradbury will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how the City of Bradbury intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the City's General Plan, Capital Improvement Plans, and Building & Safety Codes.

1.9 Plan Adoption

Adoption of the Natural Hazard Mitigation Plan by the local jurisdiction's governing body is one of the prime requirements for approval of the plan. When the plan is completed, the City Council will be responsible for adopting the City of Bradbury Natural Hazard Mitigation Plan. The local agency governing body has the responsibility and authority to promote sound public policy regarding protection from natural hazards. The City Council will periodically need to revisit the Plan as it is revised to meet changes in the risk of natural hazards and exposure. The approved Natural Hazard Mitigation Plan will be a significant tool in shaping the future growth and development of the community.

1.10 Coordinating Body

A City of Bradbury Hazard Mitigation Advisory Committee will be responsible for coordinating implementation of the Plan's action items and undertaking the future review process. The City Council will assign representatives from City agencies, including, but not limited to, the current Hazard Mitigation Advisory Committee members.

1.11 Convener

The City Council will adopt the City of Bradbury Natural Hazard Mitigation Plan, and the Hazard Mitigation Advisory Committee will take responsibility for plan implementation. The City Manager will serve as the convener with the responsibility to facilitate the Hazard Mitigation Advisory Committee in meeting its goals and objectives. Plan implementation and evaluation will be a shared responsibility among the implementing agencies.

1.12 Implementation using Existing Programs

The City of Bradbury addresses statewide planning goals and objectives through its General Plan, Capital Improvement Plans, and City Building & Safety Codes. The Natural Hazard Mitigation Plan provides a series of recommendations that are closely related to the goals and objectives of these existing planning programs. The City of Bradbury will have the opportunity to implement recommended mitigation action items through existing planning and development programs and procedures.

1.13 Economic Analysis of Mitigation Projects

The Federal Emergency Management Agency's (FEMA) approach to identifying costs and benefits associated with natural hazard mitigation strategies or projects are set forth in two general categories: 1) benefit/cost analysis and 2) cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking in order to avoid future disaster-related damages. Cost-effectiveness analysis evaluates how to best spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural Hazard can provide decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

1.14 Formal Review Process

The City of Bradbury Natural Hazard Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a formal schedule and time line that identifies the local agencies and organizations the will participate in the plan evaluation. The convener will be responsible for contacting the Hazard Mitigation Advisory Committee members and organizing the annual meeting. Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

1.15 Continued Public Involvement

The City of Bradbury is dedicated to involving the public directly in the continual review and update of the Hazard Mitigation Plan. Copies of the plan will be catalogued and made available at City Hall. The existence and location of these copies will be publicized in City newsletters. The Plan also includes the address and the phone number of the City Planning Department, which is responsible for keeping track of public comments on the Plan. In addition, copies of the Plan and any proposed changes will be posted on the City website. This site will also contain an email address and phone number to which people can direct their comments and concerns.

2.0 INTRODUCTION

Historically, the residents of City of Bradbury have dealt with the various local natural hazards. Residents of the area have been exposed to earthquakes, earth movements, flooding and wildfires.

Although the population of the City has not changed significantly over the previous decade, natural hazards have impacted the lifestyles of the residents. As the population and development of the City continues to increase, exposure to natural hazards creates greater safety and financial risks than previously experienced.

The City of Bradbury's population ranks 86 out of a total of 88 cities in the County of Los Angeles and offers the benefits of living in a Mediterranean type climate. The City is strictly a single-family residential community. No land has been set aside for commercial or industrial development. For the most part, attractive large residential estate lots that range in size from one to five acres characterize the community. The community also contains a proportionate number of 7,500 and 20,000 square foot residential parcels. Due to the City's location at the base of the San Gabriel Mountains, the potential impacts of natural hazards associated with the foothill terrain make the environment and population vulnerable to certain natural disasters.

The City is subject to earthquakes, earth movements, flooding and wildfires. It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the community. However, with careful planning and collaboration among public agencies, private sector organizations, and residents, it is possible to minimize losses and impacts that can result from these natural disasters.

2.1 Why Develop a Hazard Mitigation Plan

As the cost resulting from damage caused by natural disasters continues to increase, the community realizes the importance of identifying effective ways to reduce vulnerability to these potential disasters. Natural hazard mitigation plans can assist communities in reducing risk from natural hazards by identifying resources, providing information, and developing strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

This Plan provides a set of action items designed to reduce risk from natural hazards through education and outreach programs. The Plan is designed to foster partnerships and implement preventative activities such as land use programs that restrict and control development in areas subject to damage from natural Hazard.

The resources and information contained in the Hazard Mitigation Plan include:

- (1) Establishes a basis for coordination and collaboration among agencies and the public in City of Bradbury;
- (2) Identifies and prioritizes future mitigation projects; and
- (3) Assists in meeting the requirements of federal assistance programs.

The Hazard Mitigation Plan works in conjunction with other City plans, including the City General Plan and Public Safety Emergency Operations Plans.

2.2 The Mitigation Plan Affects:

The City of Bradbury Natural Hazard Mitigation Plan affects the entire City. The Plan provides a framework for planning for natural hazards. The resources and background information in the Plan is applicable Citywide, and the goals and recommendations will lay the groundwork for related plans and partnerships.

Planning for natural hazards should be an integral element of the City's land use planning program. All California cities and counties have General Plans and the implementing ordinances that are required to comply with the statewide planning goals and regulations.

The continuing challenge faced by local officials and the state government is to keep the network of local plans effective in responding to the changing conditions and needs of California's diverse communities, particularly in light of the very active seismic region in which we live.

This is particularly true in the case of planning for natural hazards where communities must balance development pressures with detailed information on the nature and extent of hazards.

Planning for natural hazards requires local plans to include inventories, policies, and ordinances to guide development in identified hazard areas. The inventories should include a compendium of hazards facing the community, the at risk built environment, personal property that may be damaged by hazard events, and certainly the most critical is an identification of the people who live in the shadow of these hazards.

2.3 Support for Natural Hazard Mitigation

All mitigation efforts will be the responsibility of each locale with the authority to develop and implement risk reduction strategies and policies. Local jurisdictions, however, are not alone. Partners and resources exist at the regional, state and federal levels. Numerous California state agencies have a role in natural hazard mitigation. Some of the key agencies include:

1. The Governor's Office of Emergency Services (OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
2. The Southern California Earthquake Center (SCEC) gathers information about earthquakes, integrates this information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduces economic losses, and save lives.
3. The California Division of Forestry (CDF) is responsible for all aspects of wild-land fire protection on private and state owned land. CDF administers forest preservation regulations, including landslide mitigation, on non-federally owned land.
4. The California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, the development of partnerships aimed at reducing risk, and exceptions (based on science-based refinement of tsunami inundation zone delineation) to state mandated tsunami zone restrictions; and
5. The California Division of Water Resources (DWR) plans, designs, constructs, operates,

and maintains the State Water Project; regulates dams, provides flood protection and assists in emergency management. It also educates the public and serves local water needs by providing technical assistance

2.4 Plan Methodology

Information in the Hazard Mitigation Plan is based on research from a variety of sources. Staff from the City of Bradbury conducted data research and analysis, facilitated steering committee meetings and public workshops, and developed the final mitigation plan. The research methods and various contributions to the plan include:

The Hazard Mitigation Advisory Committee convened for two (2) meetings to discuss and review development of the Mitigation Plan. The committee played an integral role in developing the mission, goals, and action items for the mitigation plan. The committee consisted of representatives of public and private agencies and organizations in the City of Bradbury including:

- City of Bradbury Building and Safety
- City of Bradbury Emergency Management Officer/ Public Information Officer
- City of Bradbury Finance
- City of Bradbury Planning
- County of Los Angeles Road Division
- City of Bradbury Water Purveyor (SOCAL Water)

City staff also received input on the plan from organizations interested in natural hazard planning. The City was assisted with identifying common concerns related to natural hazards. Important long range and short-term activities, that may to reduce risk from natural hazards, were compiled. A complete listing of these organizations is provided below.

- Water Provider (CAL American Water)
- Los Angeles County Fire Department
- Los Angeles County Sheriffs Department
- Los Angeles County Roads Division
- Los Angeles County Office of Emergency Management
- Utility Providers (electricity, telephone and gas)
- Local Homeowner Associations

2.5 State and Federal Guidelines and Requirements for Mitigation Plans

Following are the Federal requirements for approval of a Hazard Mitigation Plan:

- Open public involvement with public meetings that introduce the process and project requirements.
- The public must be afforded opportunities for involvement in: 1) identifying and assessing risk; 2) drafting a plan; and 3) involvement in approval stages of the plan.
- Community cooperation, with opportunity for other local government agencies, educational institutions, and local agencies to participate in the process.

- Incorporation of local documents, including the local General Plan, the Zoning Ordinance, the Building Codes, and other pertinent documents.

The following components must be part of the planning process:

- Complete documentation of the planning process
- A detailed risk assessment on hazard exposures in the community
- A comprehensive mitigation strategy, which describes the goals & objectives, including proposed strategies, programs & actions to avoid long-term vulnerabilities.
- A plan maintenance process, which describes the method and schedule of monitoring, evaluating and updating the plan and integration of the Hazard Mitigation Plan into other planning mechanisms.
- Formal adoption by the City Council.
- Plan Review by both State OES and FEMA

2.6 Public Workshops

The City of Bradbury staff facilitated two public workshops to gather comments and ideas from City of Bradbury citizens about mitigation planning and priorities for mitigation plan goals. The first workshop was held on July 28, 2004 and the second workshop was held on August 25, 2004.

The resources and information cited in the Plan provide a strong local perspective and help identify strategies and activities to make City of Bradbury more disaster resilient.

2.7 Utilization of the Plan

Each section of the Plan provides information and resources to assist people in understanding the City and the hazard-related issues facing citizens and the environment. Combined, the sections of the Plan work together to create a document that guides the mission to reduce risk and prevent loss from future natural hazard events.

The structure of the Plan enables people to use a section of interest to them. It also allows the City Council to review and update sections when new data becomes available. The ability to update individual sections of the Plan places less of a financial burden on the City. Decision-makers can allocate funding and staff resources to selected pieces in need of review, thereby avoiding a complete plan update, which can be costly and time-consuming. New data can be easily incorporated, resulting in a natural hazard mitigation plan that remains current and relevant to City of Bradbury.

2.8 Five-Year Action Plan

The Five-Year Action Plan provides an overview of the mitigation plan mission, goals, and action items. The plan action items are included in Section 5, and they address multi-hazard issues, as well as hazard-specific activities that can be implemented to reduce risk and prevent loss from future natural hazard events.

3.0 COMMUNITY PROFILE

Natural hazards impact citizens, property, the environment, and the economy of City of Bradbury. Earthquakes, earth movements, flooding, wildfires and windstorms have exposed City of Bradbury residents to the financial and emotional costs of recovering after natural disasters. The risk associated with natural Hazard increases as more people move to areas affected by natural hazards.

The inevitability of natural hazards, and the growing population and activity within the City create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future natural hazard events. Identifying the risks posed by natural hazards, and developing strategies to reduce the impact of a hazard event can assist in protecting life and property. Local residents can work together with the City to create a natural hazard mitigation plan that addresses the potential impacts of hazard events.

3.1 Geography and the Environment

The City of Bradbury is 1.99 square miles in size and is a residential community, with no land set aside for commercial or industrial development. The southern two-thirds of the City have been subdivided, with the northern portion consisting of steep hillsides located at the base of the San Gabriel Mountains. Areas of the City developed as residential typically consist of lots ranging in size between one and five acres. A substantial portion of the City is developed with lots ranging in size from 7,500 to 20,000 square feet. Development densities in the City largely reflect constraints associated with topography, lack of infrastructure, natural hazards (flooding, wildfire and seismic risks), and other development constraints.

3.2 Community Profile

The City of Bradbury is rich in history. Mr. Lewis Leonard Bradbury first settled the area comprising the City of Bradbury in 1892. The City itself was incorporated in 1957. The principal east-west major arterial roadway that serves the City of Bradbury is Huntington Drive located one-quarter mile to the south of the City. Huntington Drive is a fully improved four-lane arterial highway with a raised landscaped median. This highway has an interconnected system of traffic signals that provides an efficient flow of traffic. The Interstate 210 Freeway is located just south of Huntington Drive. Royal Oaks Drive, an east-west secondary highway, is located at the City's southern boundary. Important north-south roadways providing access to the City include Buena Vista Street and Mount Olive Drive. The Interstate Freeway 605 provides access to the south. It terminates at the I-210 Freeway. Roadways inside the City are local and local collector streets limited to two travel lanes. The local streets provide direct access to individual properties. The roadway locations are generally dictated by topographical constraints. A series of private streets services the Bradbury Estates and the Woodlyn Lane Estates. The private streets have narrow roadbeds of between 15 and 20 feet in width. Many of the private streets are steep and curve throughout the private gated communities. Exhibit 3 identifies major roads within the City that will be utilized for evacuation.

3.3 Climate

The climate in Bradbury may be characterized as Mediterranean. Winters are seldom cold and frost conditions are rare. The temperatures seldom fall below twenty-eight degrees Fahrenheit (28°F). Spring days may be cloudy due to the presence of early morning and late night high fog

conditions. Summers are warm but are not extremely hot (typical summer temperatures range from 68°F to 81°F). The area has lower winter temperatures than a marine climate. Annual average daytime temperatures range from 84.1°F in August to 66.6°F in January. Overnight low temperatures vary from 64.4°F in summer to 48.4°F during winter. Annual precipitation in Bradbury is 14.85 inches and occurs almost exclusively from late October to early April.

Winds across the City are an important meteorological parameter since they control both the initial dilution rate of locally generated air pollutant emissions. Predominant wind patterns for the Bradbury area generally follow those described for the Basin. During the day, the effects of the onshore flow reach inland across the Los Angeles basin. During the night, surface radiation cools the air in the surrounding mountains and hills. The air then flows into the valleys and meanders to the coast, producing a gentle "land breeze". The City's proximity to the mountains leads to cooler periods due to cool mountain air flowing from the slopes to lower elevations.

The predominant daytime wind pattern is from the west to southwesterly directions, demonstrating the effect of the regional onshore flow pattern. At night, the direction of the local offshore flow is generally from the east to northeasterly. The predominant wind patterns for the Bradbury area are broken by occasional winter storms and episodes of Santa Ana winds. Santa Ana winds are strong northerly or northeasterly winds that originate in the high desert located to the east of the City. Santa Ana wind conditions are intermittently experienced in the fall and winter from September through March. The Santa Ana's are usually warm, very dry, and often full of dust, these winds are particularly strong in passes and at the mouths of canyons. On the average, Santa Ana winds occur five to ten times a year, each episode lasting up to a few days.

There are frequent periods of four to five months with no rain. In the winter, an occasional storm from the high latitudes sweeps across the coast, bringing rain. The average annual rainfall is 14 to 18 inches, and the frost-free season ranges from 210 to 250 days per year.

3.4 Minerals and Soils

The characteristics of the minerals and soils present in City of Bradbury indicate the potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquakes, flooding, liquefaction and landslides.

The City of Bradbury is underlain by three soil types: (1) the Vista-Amargosa Association, located in the northern third of the City; (2) the Ramona-Placentia Association, located in the central-third of the City; and (3) the Hanford Association, located in the southern-third of the City.

The soils of the Vista-Amargosa Association occur in steep mountainous areas at elevations ranging from 1,300 to 3,900 feet above mean sea level (amsl). Natural vegetation consists mainly of annual grasses and forbs, but California juniper and manzanita grow in some places. Vista soils are 28 to 38 inches deep, are well drained, and have moderately rapid subsoil permeability. They have a brown, slightly acid, coarse sandy loam surface layer about 16 inches thick. The subsoil is brown, neutral, sandy loam about 12 inches thick and contains 2 or 3 percent more clay than the surface layer. Below is yellowish-brown, neutral, coarse sandy loam on hard granite rock. Available water-holding capacity is 2.5 to 3.5 inches for 28 to 38 inches of soil depth. Inherent fertility is low.

Amargosa soils are 14 to 20 inches deep, are excessively drained, and have moderate to rapid, subsoil permeability. They have a brown and yellowish-brown, slightly acid coarse sandy loam surface layer that is about 13 inches thick. Below is a yellowish-brown slightly acid gravelly sandy loam layer, containing about 20 percent by volume gravel, and resting on hard, granitic rock of about 14 to 20 inches. Sheet and rill erosion have been moderate on these soils, removing from 25 to 40 percent of the original surface soil. Rock outcrops cover from 2 to 10 percent of the surface and many areas are cut by shallow gullies. Available water-holding capacity is 1.0 to 1.5 inches for 14 to 20 inches of soil depth. Inherent fertility is very low. These soils are used for range, wildlife and watershed.

The soils of the Ramona-Placentia Association occur on strongly sloping and rolling terraces between elevations of near sea level to 3,900 feet above mean sea level. Natural vegetation consists mainly of annual grasses and forbs with occasional California junipers. Ramona and Placentia soils of this association occur on steeper slopes and are eroded. Gullies are common and about 50 percent of the original surface soil has been removed by erosion. The available water-holding capacity of Ramona soils is about 7.0 to 9.0 inches for 60 inches of rooting depth. Inherent fertility is low. The available water-holding capacity of Placentia soils is about 1.0 to 1.5 inches for 9 inches of soil depth. These soils are used for residential purposes and for irrigated gated orchards.

The soils of the Hanford Association occur on gently sloping alluvial fans between elevations of near sea level to 3,500 feet above mean sea level. Natural vegetation consists mainly of annual grasses and forbs and, occasionally, junipers. Hanford soils are over 60 inches deep, are well drained, and have moderately rapid subsoil permeability. They have pale-brown coarse sandy loam surface layers about 8 inches thick underlain by light yellowish-brown coarse sandy loam and gravelly loamy coarse sand substratum. Typically, they are slightly acid to mildly alkaline throughout, but occasionally are calcareous in the lower part. Thin layers of coarser material may occur below 40 inches. Available water-holding capacity is 5.0 to 7.5 inches for 60 inches of soil depth. Inherent fertility is moderate. Hanford soils make up about 85 percent of the Association, with 10 percent Yolo soils and 5 percent Hesperia soils. In the Los Angeles basin, these soils are used almost exclusively for residential and industrial purposes. These soils will also support irrigated crops such as alfalfa, small sugar beets, potatoes, and fruit and nut trees.

3.5 Other Significant Geologic Features

Geologic hazards in the City of Bradbury include the potential for landslides; erosion and debris flow in areas with steep slopes and liquefaction in areas with loose soils and high water tables. Landslide hazards may involve relatively intact, dense bedrock materials or highly fractured and broken, jumbled bedrock. Landslides often occur along pre-existing zones of weakness within the bedrock. Local folding of the bedrock adds to the potential for slope failure. Landslides occur where the dip of the bedding of the rock is parallel with the slope. However, many landslides do not seem to be controlled by the position of the bedding relative to the topography but by other factors such as rock type and its attendant characteristics (density of jointing and fracturing).

Major landslides hazards in the area are present on the northern sections of the City, which have steep slopes. These areas coincide with areas where landslides have already occurred. This is not to say that areas with no prior record of landslides are not likely to have landslides. If changing conditions adversely affect slope stability, landslides may occur.

Erosion is the natural process by which earth materials are loosened, worn away, decomposed or dissolved, and transported to another site within a few feet or many miles away. Precipitation and runoff, running water, and wind are common agents of erosion. The potential for erosion is generally low in exposed natural slopes but greatly increases to highly erodible in excavated slopes or steep channel walls in natural drainage courses. The potential for erosion ranges from low to high, depending on the soil or bedrock type and the amount of vegetation. Barren slopes are usually more susceptible to erosion and subject to riling or raveling. In addition, bedrock landslide debris is more susceptible to erosion than adjacent bedrock.

The potential for debris flow (mudflow) depends primarily on the presence of colluvium deposits up slope, the slope, and the increase in soil moisture content typically due to heavy rainfall. Debris flows often occur when saturated soils are subjected to a rainstorm of high intensity and short duration. Another factor contributing to debris flow is the loosening of near-surface soils by weathering. Wetting and drying of soils result in alternate expansion and contraction which, through many cycles, cause a gradual loosening and weakening of surface soils. Root growth and the burrowing of insects and rodents also contribute to the loosening of the soil. This allows more rapid penetration of moisture and when saturation occurs to sufficient depth, the surface materials begin to flow.

Debris flows commonly originate as shallow soil slumps at the heads of natural drainage channels. The rigid soil mass is deformed into viscous fluid and moves down the natural drainage swale and it takes in additional soil and vegetation scoured from the channel during the flow. The velocity of the flow depends on viscosity, the slope gradient, the height of the slope, the roughness of the channel, and the baffling effect of vegetation. The Bradbury and Spinks Canyon Debris Basins control debris flow in the City.

Faults are typically classified as being active, potentially active, or inactive. Active faults are those that have exhibited movement within the past 10,000 years. The exact time limits for planning purposes are usually defined in relation to contemplated uses and structures. The locations of the regional faults are shown in Exhibit 4.

The Newport-Inglewood Fault Zone is approximately 29 miles south of the City of Bradbury. Recent earthquakes greater than Magnitude 4.0 and also the historic Magnitude 6.3 Long Beach Earthquake on March 11, 1933, centered offshore near Newport Beach suggest an active seismic history. Although there has been no observed ground surface displacement associated with the Newport-Inglewood Fault Zone, there may have been subsurface fault displacement of approximately seven inches associated with the October 21, 1941, earthquake (Magnitude 4.9) and with the June 18, 1944, earthquake (Magnitude 4.5). This Fault Zone could generate a 7.0± Magnitude earthquake within the next 50-100 years.

The Norwalk Fault is approximately 15 miles south of the City of Bradbury. This fault strikes 65 to 85 degrees to the northwest and dips steeply to the northeast. The fault is noted as the possible source of a damaging earthquake (Magnitude 4.7) occurring on July 8, 1929, which caused significant damage in Whittier and Norwalk. The fault is approximately 16 miles long and has an accurate trace between Buena Park and Tustin. Micro-seismic activity along the Norwalk Fault is high and Richter (1958) suggests that the fault may be capable of generating a Magnitude 6.3 earthquake.

The San Andreas Fault Zone is located approximately 24 miles north of the City of Bradbury. This fault zone extends from the Gulf of California northward to the Cape Mendocino area.

where it continues northward along the ocean floor. The total length of the San Andreas Fault Zone is approximately 750 miles. The activity of the fault has been recorded during historic events, including the 1906 (Magnitude 8) event in San Francisco and the 1857 (Magnitude 7.9) event between Cholame and San Bernardino, where at least 250 miles of surface rupture occurred. These seismic events are among the most significant earthquakes in California history. The length of the fault and its active seismic history indicates that it has a very high potential for large-scale movement in the near future (Magnitude 8.0±).

The San Fernando Fault Zone is approximately 20 miles northwest of the City of Bradbury. Fault segments that were demonstrably Involved in the February 9, 1971 San Fernando Earthquake (Magnitude 6.4) are, for the most part, east-west trending thrust faults with associated left lateral movement. The ground surface ruptures occurred on little known pre-existing faults in an area of low seismicity and previously unknown historic ground displacement. The earthquake epicenter of the February 9, 1971 earthquake was near the community of Newhall. The recurrence interval for the San Fernando Fault Zone is estimated to be approximately 200 years.

The Whittier-Elsinore Fault Zone is approximately 12 miles south of the City of Bradbury. This northwest-trending fault trends from Whittier Narrows southeast across the Santa Ana River, past Lake Elsinore, into western Imperial County and then into Mexico. This fault zone has the expected maximum capability of a magnitude 6.6 earthquake.

The San Gabriel Fault, also a potentially active fault, is located approximately 12 miles north of the City of Bradbury. This fault extends from Frazier Park, located in Orange County through San Gabriel Valley to Mount Baldy Village, a distance of approximately 84 miles. Because of its length and its ancestral relationship with the San Andreas Fault System, its potential future activity must be realized. Due to the length of its surface trace, the San Gabriel Fault is believed capable of generating a 7.8 Magnitude earthquake.

The City of Bradbury, like most of the Los Angeles Basin, is located over or near one or more known earthquake faults, and potentially many more unknown faults, particularly so-called lateral or blind thrust faults. The City of Bradbury is located approximately 18 miles southeast of the Santa Monica Fault, also classified as a potentially active fault. No detailed information is available on the exact location of this southwest-northeast trending fault at the ground surface (fault trace), or on its geometric orientation. This fault, the Malibu Coast Fault, and the Raymond Fault belong to one large fault system. The San Fernando and Sierra Madre Fault Zones are also north-dipping mountain frontal thrust faults; therefore, comparisons of the Santa Monica, Raymond, Malibu Coast, Sierra Madre, and San Fernando Faults can be suggested. Experience from the 1971 San Fernando Earthquake indicates that the Santa Monica Fault could generate a moderate seismic event (Magnitude 6.6). This fault, consequently, is classified as potentially active.

The Verdugo Fault is approximately 12 miles west of the City of Bradbury. This potentially active fault bounds the south flank of the Verdugo Mountains and appears to merge with the Eagle Rock-San Rafael Fault System in the vicinity of the Verdugo Wash. Low magnitude earthquakes (less than 3.0) which have been attributed to activity along the Verdugo Fault are occasionally recorded in the Burbank-Glendale area. No direct evidence of ground displacement has been observed associated with these low-magnitude seismic events (earthquakes). The Verdugo Fault has a high potential for future activity and is capable of generating a Magnitude 6.4 earthquake. It is not considered to have had seismic activity during historic time.

The City of Bradbury has two earthquake faults within the City limits (refer to Exhibit 4). The Sierra Madre Fault extends through the major portion of Bradbury along the base of the San Gabriel Mountains. This fault is clearly exposed in some areas of the San Gabriel Valley, with a reverse movement. Movement along these frontal faults has resulted in the uplift of the San Gabriel Mountains. Seismic activity is expected to be a maximum of 7.2 magnitude.

The 5.8 magnitude Sierra Madre earthquake of June 28, 1991, occurred 11 miles northeast of Pasadena at a depth of 7 miles under the San Gabriel Mountains of the Central Transverse Ranges. The event appears to have occurred on the Clamshell-Sawpit Fault, an offshoot of the Sierra Madre Fault Zone. The main shock was followed by an aftershock sequence with 103-recorded aftershocks at a .6 magnitude and 29 aftershocks greater than 1.5 magnitude. The Sierra Madre Fault Zone follows the base of the mountains from Cajon Pass to San Fernando in a series of accurate, 9-15.5 mile, long fault segments.

The Duarte Fault extends across the southern portion of Bradbury and bisects an unincorporated County island. The existence of the Duarte Fault is determined by a groundwater barrier, which could be a possible extension of the Sierra Madre Fault Zone to the north. The Duarte fault is a buried fault in the Bradbury area and would require additional study to determine its exact location.

The Raymond Hill Fault is approximately 15 miles west of the City of Bradbury. The northeast-southwest trending Raymond-Hill Fault Zone has a length of approximately 16 miles, width of 0.25 miles, and consists of one to three strands that diverge from the foothills of the San Gabriel Mountains in Sierra Madre to the Adams Hill area of Glendale. The sense of movement on the fault is reverse left-oblique. The fault serves as a ground water barrier and is coincident with an obvious topographic scarp along much of its extent between Monrovia Canyon and Arroyo Seco. Geologic evidence suggests there has been a minimum of 222 feet of vertical displacement along a portion of the fault near Raymond Hill since Miocene Time, and that clay gouge along the fault within the alluvium serves as an aquiclude. Age dating of soil material, which fills cracks probably caused by the latest movement of this fault, suggests that the fault moved approximately 3,000 years ago. The maximum credible earthquake expected from the Raymond-Hill Fault is Magnitude 6.8, if the entire 16-mile length of the fault were to break.

3.6 Population and Demographics

The City of Bradbury has a population of about 1,000 in an area of 1.9 square miles. The population of City of Bradbury has steadily increased from 518 residents at the time of incorporation in 1957.

The increase of people living in City of Bradbury creates more community exposure and changes how agencies prepare for and respond to natural Hazard. For example, more people living on the urban fringe can increase risk of fire. Wildfire has an increased chance of starting due to human activities in the urban/rural interface, and has the potential to injure more people and cause more property damage. But an urban/wildland fire is not the only exposure to the City of Bradbury. In the 1987 publication, Fire Following Earthquake issued by the All Industry Research Advisory Council, Charles Scawthorn explains how a post-earthquake urban conflagration would develop. The conflagration would be started by fires resulting from earthquake damage, but made much worse by the loss of pressure in the fire mains, caused by either lack of electricity to power water pumps and /or loss of water pressure resulting from broken fire mains.

Furthermore, increased density can affect risk. For example, narrower streets are more difficult for emergency service vehicles to navigate, the higher ratio of residents to emergency responders affects response times, and homes located closer together increase the chances of fires spreading.

The majority of the housing units were built around the 1960's. In November 1980, 50 units representing 16 percent of the City's housing stock were lost in a wildfire.

Natural hazards do not discriminate, but the impacts in terms of vulnerability and the ability to recover vary greatly among the population. According to Peggy Stahl of the Federal Emergency Management Agency (FEMA) Preparedness, Training, and Exercise Directorate, 80% of the disaster burden falls on the public, and within that number, a disproportionate burden is placed upon special needs groups: women, children, minorities, and the poor.

According to the latest 2000 Census figures, the demographic makeup of the city is as follows:

59%	Caucasian
14%	Hispanic
5%	African American
20%	Asian
1%	Native American
1%	Other

The ethnic and cultural diversity suggests a need to address multi-cultural needs and services. Vulnerable populations, including seniors, disabled citizens, women, and children, as well as those people living in poverty, may be disproportionately impacted by natural hazards.

Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA's Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural disasters identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

The cost of a natural hazard recovery can place an unequal financial responsibility on the general population when only a small proportion may benefit from governmental funds used to rebuild private structures. Discussions about natural hazards that include local citizen groups, insurance companies, and other public and private sector organizations can help ensure that all members of the population are a part of the decision-making processes.

3.7 Land and Development

Development in Southern California from the earliest days was a cycle of boom and bust. The Second World War, however, dramatically changed that cycle. Military personnel and defense workers came to Southern California to fill the logistical needs created by the war effort. The available housing was rapidly exhausted and existing commercial centers proved inadequate for the influx of people. Immediately after the war, construction began on the freeway system, and the face of Southern California was forever changed. Home developments and shopping centers sprung up everywhere and within a few decades the central basin of Los Angeles County was virtually built out. This pushed new development further and further away from the urban center.

The City of Bradbury General Plan addresses the use and development of private land. The General Plan is one of the City's most important planning tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces. The environment of most Los Angeles County cities is nearly identical with that of their immediate neighbors and the transition from one incorporated municipality to another is seamless to most people. Thus exposure to the natural hazards affects all of Southern California.

3.8 Housing and Community Development

In the City of Bradbury the demand for housing outstrips the available supply, and the recent low interest rates have further fueled a pent-up demand. The median income for a household in the City is \$100,454, and the median income for a family is \$106,736. Single-family detached homes make up the entirety of the City's housing stock (97%).

Pursuant to California Government Code Section 65584(a), the Southern California Association of Governments (SCAG) is responsible for analyzing and identifying the future housing stock for the City. For the period of 2000 to 2005, SCAG allocated an estimated need of 12 units.

There is an increased concentration of resources and capital in the City of Bradbury. The best indicator of this fact is the increasing per capita personal income in the region since the 1970's. Per capita income is an estimate of total personal income divided by the total population.

This estimate can be used to compare economic areas as a whole, but it does not reflect how the income is distributed among residents of the area being examined. The City's per capita personal income is also increasing relative to California's and the United State's average per capita incomes, resulting in a more/less affluent community than the average population.

Subtle but very measurable changes occur constantly in communities that increase the potential loss that will occur in a major disaster. There are a number of factors that contribute to this increasing loss potential. First, populations continue to increase, putting more people at risk within a defined geographic space. Second, inflation constantly increases the value of real property and permanent improvements. Third, the amount of property owned per capita increases over time.

If we look at the greatest recorded earthquakes in American history, and compare the level of population and development today with that which existed at the time of the event, the scale of potential damage is staggering.

1886 Charleston EQ M7.3 in Charleston, SC
Estimated insured damage if happened today \$10 Billion

1906 San Francisco EQ M8.3 Significant fire following damage
Estimated insured damage if happened today \$36 Billion

1811-12 New Madrid EQ 1811-12, series of 4 EQs over 7 weeks
Estimated insured damage if happened today \$88 Billion

Source: Risk Management Solutions

3.9 Employment and Industry

The Southern California Association of Governments (SCAG), South Coast Air Quality Management District (SCAQ), and State Department of Housing and Community Development (HCD) are promoting jobs/housing balance as a means to solve a number of pressing problems in the Southern California region.

Jobs/housing balance is a concept where a regional balance is achieved if the number of housing units is only slightly less than the employment opportunities. This means that most of the people living in the area can also work in the area. The benefits of such a jobs/housing balance include less traffic congestion, fewer vehicle emissions with resulting in a clean air benefit, decreased commute times, and a reduction in the need for major capital expenditures for the development of mass transit facilities.

A balanced region is technically defined as a region where the ratio of jobs to housing is 1.20 (that is 1.20 jobs for every dwelling unit) in 2010. Job rich regions refer those that have jobs/housing ratios substantially greater than that for the surrounding region (1.20 for 2010). Housing rich areas have lower ratios than that of the surrounding region. The SCAG definition of jobs/housing balance does not consider housing affordability into the jobs/housing balance equation. Ideally, the jobs/housing balance should also consider the relationship of housing affordability to the prevailing wages of the locality. SCAG recommends that the match between housing affordability and incomes be considered through the review of individual projects and in the "implementation process."

SCAG has prepared employment, housing and population projections for twenty-four subregions that comprise the SCAG planning area. The City of Bradbury is located in the East San Gabriel Valley Subregion. This subregion had a 2000 jobs/housing ratio of 1.03, making it housing-rich. If trend projections are correct, this subregion could experience a population increase of 332,200 persons, 122,100 new units, and 152,300 additional jobs between 2000 and 2010. The GMP has established a job/housing balance performance goal ratio of 1.25 for the subregion from 2000 to 2010. This will bring the subregion to a ratio of 1.10 by 2010. Thus, the subregion is defined as housing rich and jobs poor and will require more local jobs for its residents.

The impacts on population and housing include an increase in resident population due to new housing development in the City. The Land Use Plan contains approximately 1,199 acres designated for residential uses. This land could accommodate up to 501 dwelling units at theoretical build out.

The majority of the vacant land in the City is located in hillside areas that present a number of constraints to development. As a result, the actual number of units, after the hillside development standards are imposed is likely to reflect less development than what is actually identified by the General Plan Land Use Element.

Mitigation activities are needed at the local level to ensure the safety and welfare of residents commuting to surrounding areas to industrial and business centers. This creates a greater dependency on roads, communications, accessibility and emergency plans to reunite people with their families. Before a natural hazard event, large and small businesses can develop strategies to prepare for natural Hazard, respond efficiently, and prevent loss of life and property.

3.10 Transportation and Commuting Patterns

The City's roadway network is influenced in part by its residential character and hillside rural atmosphere. Roadways in the City serve residential estates. The steep terrain calls for winding narrow roadways. There are no signalized intersections in the City. Intersection traffic control is limited to stop signs. Access to the City is limited to local collector roads in the neighboring cities of Monrovia and Duarte. These access roads have limited capacity to accommodate increased traffic volumes.

The principal regional access to the City of Bradbury is provided by two nearby freeways, the San Gabriel River Freeway (Interstate Route 605) and the Foothill Freeway (Interstate Route 210). The nearest freeway access to the City includes the Mount Olive Drive/Huntington Drive ramps at the I-605/I-210 freeway interchange. Vehicles exiting at this location can continue northbound on Mount Olive Drive into Bradbury. Additional nearby freeway access is provided by the Buena Vista Street and Mountain Avenue off-ramps on the I-210 freeway.

The principal east-west major roadway that serves the City of Bradbury is Huntington Drive located in the City of Duarte, one-quarter mile to the south. Huntington Drive is a fully improved four-lane highway with raised landscaped median. This highway has an interconnected system of traffic signals that provide and maintain an efficient flow of traffic. Royal Oaks Drive and Royal Oaks Drive North, are east-west local collector roads located at the City's southerly boundary. Other important north-south roadways providing access to the City include Buena Vista Street and Mount Olive Drive. Roadways inside the City are limited to two travel lanes and are designed to provide direct access to individual properties.

The City of Bradbury does not maintain any fixed transit routes within the City. Fixed route transit is provided by the Metropolitan Transit Authority, through connections in the City of Duarte. Bicycle riding is permitted and encouraged on City streets. Some elementary students ride their bicycles to school. Regional bicycle and pedestrian travel routes exist on the Duarte Bikeway and the San Gabriel River Trail. The Duarte Bikeway is located along the vacated railroad right-of-way between Buena Vista Street and Las Lomas Drive. The San Gabriel River Trail extends from the City of Azusa to the City of Seal Beach. No freight or passenger rail service is available within the City of Bradbury. The closest railroad facility is the AT&SF tracks and right-of-way located one mile south of the City.

In that Bradbury is a single-family residential community, close to 100 percent of City of Bradbury's population works outside of the City. This suggests that virtually all of Bradbury's residents work outside the City. As housing development increases, daily vehicle trips rise and there is an increased risk that a natural hazard event will disrupt the travel plans of residents across the region, as well as local, regional and national commercial traffic.

Localized flooding can render roads unusable. A severe winter storm has the potential to disrupt the daily driving routine of hundreds of thousands of people. Natural hazards can disrupt automobile traffic and shut down local and regional transit systems. Flooding may occur within the surrounding communities. Bradbury has not been identified by FEMA as having a flooding problem.

4.0 RISK ASSESSMENT

Conducting a risk assessment can provide information: 1) on the location of hazards, the value of existing land and property in hazard locations; and 2) an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the three levels of a risk assessment include identification, profiling and vulnerability.

4.1 Hazard Identification

Hazard Identification is the description of the geographic extent, potential intensity and the probability of occurrence of a given hazard. Maps are frequently used to display hazard identification data. The City of Bradbury identified four major hazards that affect this geographic area. These hazards are: earthquakes, flooding, wildfires and windstorms. Input was obtained from research performed by the Hazard Mitigation Advisory Committee. The geographic extent of each of the identified hazards has been identified by the City of Bradbury using the best available data, and is illustrated in the Exhibits within this document.

4.2 Profiling Hazard Events

This process describes the causes and characteristics of each hazard, how it has affected City of Bradbury in the past, and what part of the City of Bradbury's population, infrastructure, and environment has historically been vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in each hazard section. For a full description of the history of hazard specific events, please see the appropriate hazard chapter.

4.3 Vulnerability Assessment/Inventorying Assets

This is a combination of hazard identification with an inventory of the existing (or planned) property development(s) and population(s) exposed to a hazard. Critical facilities are of particular concern because these entities provide essential products and services to the general public that are necessary to preserve the welfare and quality of life in the City and fulfill important public safety, emergency response, and/or disaster recovery functions. The critical facilities include residential uses and their supporting infrastructure, including sewer, water, and electricity. In addition, 911 centers, emergency operations centers, police and fire stations, public works facilities, communications centers, sewer and water facilities, hospitals, bridges and roads, shelters, and shelters are also at-risk.

4.4 Risk Analysis

Estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets.

4.5 Assessing Vulnerability/ Analyzing Development Trends

This step provides a general description of land uses and development trends within the community so that mitigation options can be considered in land use planning and future land use

decisions. This plan provides comprehensive description of the character of City of Bradbury in the Community Profile. This description includes the geography, the environment, population, demographics, land use and magnitude of development. The location of employment, industry, transportation and commuting patterns also play a role in assessing vulnerability. Analyzing these components of the City of Bradbury can help in identifying potential problem areas and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

Hazard assessments are subject to the availability of hazard-specific data. Gathering data for a hazard assessment requires a commitment of resources on the part of participating organizations and agencies.

Regardless of the data available for hazard assessments, there are numerous strategies the City can take to reduce risk. These strategies are described in the action items detailed in each hazard section of this Plan. Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure. Action items throughout the hazard sections provide recommendations to collect further data to map hazard locations and conduct hazard assessments.

4.6 Federal Requirements for Risk Assessment

Recent federal regulations for hazard mitigation plans outlined in 44 CFR Part 201 include a requirement for risk assessment. This risk assessment requirement is intended to provide information that will help communities to identify and prioritize mitigation activities that will reduce losses from the identified hazard. There are four hazards profiled in the mitigation plan, including earthquakes, flooding, wildfires and windstorms. The Federal criteria for risk assessment and information on how the City of Bradbury’s Natural Hazard Mitigation Plan meets those criteria is outlined in Table 4-1 below.

Table 4-1. Federal Criteria for Risk Assessment

Section 322 Plan Requirement	How this is addressed?
Identifying Hazard	Each hazard section includes an inventory of the best available data sources that identify hazard areas. To the extent GIS data are available, the City developed maps identifying the location of the hazard in the City. The Executive Summary and the Risk Assessment sections of the plan include a list of the hazard maps.
Profiling Hazard Events	Each hazard section includes documentation of the history, causes and characteristics of the hazard in the City.
Assessing Vulnerability: Identifying Assets	Where data is available, the vulnerability assessment for each hazard addressed in the mitigation plan includes an inventory of all publicly owned land within hazardous areas. Each hazard section provides information on vulnerable areas in the City in the Community Issues section. Each hazard section also identifies potential mitigation strategies.
Assessing Vulnerability: Estimating Potential Losses:	The Risk Assessment Section of this mitigation plan identifies key critical facilities and lifelines in the City and includes a map of these facilities. Vulnerability assessments have been completed for the Hazard addressed in the plan, and quantitative estimates were made for each hazard where data was available.
Assessing Vulnerability: Analyzing Development Trends	The City of Bradbury Profile Section of this plan provides a description of the development trends in the City, including the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns.

4.7 Critical Facilities and Infrastructure

Facilities critical to government response and recovery activities (i.e., life safety and property and environmental protection) include: 911 centers, emergency operations centers, police and fire stations, public works facilities, communications centers, sewer and water facilities,

hospitals, bridges and roads and shelters, Facilities that, if damaged, could cause serious secondary impacts may also be considered "critical." A hazardous material facility is one example of this type of critical facility.

Critical and essential facilities are those facilities that are vital to the continued delivery of key government services or that may significantly impact the public's ability to recover from the emergency. These facilities may include: buildings such as the jail, law enforcement center, public services building, community corrections center, the courthouse, and juvenile services building and other public facilities such as schools. The Exhibits illustrate the critical facilities, essential facilities, public infrastructure, and emergency transportation routes within the City of Bradbury

4.8 Summary

Natural hazard mitigation strategies can reduce the impacts concentrated at large employment and industrial centers, public infrastructure, and critical facilities. Natural hazard mitigation for industries and employers may include developing relationships with emergency management services and their employees before disaster strikes, and establishing mitigation strategies together. Collaboration among the public and private sector to create mitigation plans and actions can reduce the impacts of natural hazards.

5.0 MULTI-HAZARD GOALS AND ACTION ITEMS

This section provides information on the process used to develop goals and action items that pertain to the four natural Hazard addressed in the mitigation plan. It also describes the framework that focuses the plan on developing successful mitigation strategies. The framework is made up of three parts: the Mission, Goals, and Action Items.

5.1 Mission

The mission of the City of Bradbury Natural Hazard Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City toward building a safer more sustainable community.

5.2 Goals

The Plan's goals describe the overall direction that City of Bradbury agencies, organizations, and citizens can take to minimize the impacts of natural hazards. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations that are outlined in the action items.

5.3 Action Items

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the time line for implementation. Short-term action items are activities that City agencies may implement with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take five years or more years to implement.

5.4 Mitigation Plan Goals and Public Participation

The Plan goals help to guide direction of future activities aimed at reducing risk and preventing loss from natural hazards. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

Protect Life and Property

- Implement activities that assist in protecting lives by making homes, infrastructure, critical facilities, and other property more resistant to natural hazards.
- Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards.
- Improve hazard assessment information to make recommendations for discouraging new development and encouraging preventative measures for existing development in areas vulnerable to natural hazards.

Public Awareness

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
- Provide information on tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.

Natural Systems

- Balance watershed planning, natural resource management, and land use planning with natural hazard mitigation to protect life, property, and the environment.
- Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions.

Partnerships and Implementation

- Strengthen communication and coordinate participation among and within public agencies, citizens, and local organizations to gain a vested interest in implementation.
- Encourage leadership within public and private sector organizations to prioritize and implement local, county, and regional hazard mitigation activities.

Emergency Services

- Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.
- Strengthen emergency operations by increasing collaboration and coordination among

public agencies and local organizations.

- Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Public Participation

Public input during development of the mitigation plan assisted in creating plan goals. Meetings with the project steering committee, stakeholder interviews, and a public workshop served as methods to obtain input and identify priorities in developing goals for reducing risk and preventing loss from natural hazards in the City of Bradbury. On July 28, 2004, the first public workshop was held to gather ideas from City of Bradbury residents regarding the goals for the City of Bradbury Natural Hazard Mitigation Plan. The attendees included representatives from public agencies, private organizations, community planning organizations, and private residents. The attendees identified goals for the plan by examining the issues and concerns that they have had regarding natural hazards, and further discussed potential action items for the Plan.

The second public workshop was held with the City of Bradbury Planning Commission on August 25, 2004 to review mitigation plan action items and provide the Planning Commission with a chance to comment on the final plan recommendations.

5.5 Natural Hazard Mitigation Plan Action Items

The mitigation plan identifies short and long-term action items developed through data collection and research, and the public participation process. Mitigation plan activities may be considered for funding through Federal and State grant programs, and when other funds are made available through the City. Action items address multi-hazard (MH) and hazard specific issues. To help ensure activity implementation, each action item includes information on the time line and coordinating organizations. Upon implementation, the coordinating organizations may look to partner organizations for resources and technical assistance.

5.6 Coordinating Organization

The coordinating organization is the organization that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, city, or regional agencies that are capable of or responsible for implementing activities and programs.

5.7 Time line

Action items include both short and long-term activities. Each action item includes an estimate of the time line for implementation. Short-term action items are activities that city agencies may implement with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take five or more years to implement.

5.8 Ideas for Implementation

Each action item includes ideas for implementation and potential resources, which may include

grant programs or human resources.

5.9 Plan Goals Addressed

The plan goals addressed by each action item are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins.

5.10 Constraints

Constraints may apply to some of the action items. These constraints may be a lack of city staff, lack of funds, or vested property rights, which might expose the City to legal action as a result of adverse impacts on private property.

5.11 Project Evaluation Worksheets:

Each jurisdiction will have some limitations on the number and cost of mitigation activities that can be completed within a given period of time. There are likely to be multiple ideas to mitigate the effects of a given hazard. Therefore it will be necessary for the committee to select the most cost effective mitigation projects and to further prioritize them. To assist the committee in the Benefit Cost Analysis (BCA). Project Evaluation Worksheet is included in Appendix C. The data on these worksheets will help the committee determine the most cost effective mitigation solutions for the community. Some projects may need more detailed BCA, but this worksheet will provide a first screening methodology.

5.12 Multi-Hazard Action Items

Multi-hazard action items are those activities that pertain to two or more of the four hazards in the mitigation plan: landslides, flooding, windstorms and earthquakes. There are six short-term and three long-term multi-hazard action items described below.

SHORT TERM ACTIVITY - MULTI HAZARD No. 1: Integrate the goals and action items from the City of Bradbury Natural Hazard Mitigation Plan into existing regulatory documents and programs, where appropriate.

Implementation:

- Use the mitigation plan to help the City's General Plan institutionalize guidelines for sustainable development in all new construction and development projects according to the Hazard that impact the City of Bradbury
- Integrate the City's mitigation plan into current capital improvement plans to ensure that development does not encroach on known hazard areas; and
- Partner with other organizations and agencies with similar goals to promote Building & Safety Codes that are more disaster resistant at the state level.

Coordinating Organization: Hazard Mitigation Advisory Committee

Time line: Ongoing

Plan Goals Addressed: Partnerships and Implementation

Deadline: To be determined (TBD)

SHORT TERM ACTIVITY - MULTI HAZARD No. 2: Identify and pursue funding opportunities to develop and implement local and city mitigation activities.

Implementation:

- Develop incentives for local governments, citizens, and businesses to pursue hazard mitigation projects:
- Allocate city resources and assistance to mitigation projects when possible; and
- Partner with other organizations and agencies in the City of Bradbury to identify grant programs and foundations that may support mitigation activities.

Coordinating Organization: Planning Department

Time line: Ongoing

Plan Goals Addressed: Partnerships and Implementation

Deadline: To be determined (TBD)

SHORT TERM ACTIVITY - MULTI HAZARD No. 3: Establish a formal role for the City of Bradbury Natural Hazard Mitigation Committee to develop a sustainable process for implementing, monitoring, and evaluating citywide mitigation activities.

Implementation:

- Establish clear roles for participants, meeting regularly to pursue and evaluate implementation of mitigation strategies.
- Oversee implementation of the mitigation plan.
- Establish measurable standards to evaluate mitigation policies and programs and provide a mechanism to update and revise the mitigation plan.
- Monitor hazard mitigation implementation by jurisdictions and participating organizations through surveys and other reporting methods.
- Develop updates for the Natural Hazard Mitigation Action Plan based on new information.
- Conduct a full review of the Natural Hazard Mitigation Action Plan every 5 years by evaluating mitigation successes, failures, and areas that were not addressed.
- Provide training for Committee members to remain current on developing issues in the natural hazard loss reduction field.

Coordinating Organization: Hazard Mitigation Advisory Committee

Time line: Ongoing

Plan Goals Addressed: Partnerships and Implementation

Deadline: To be determined (TBD)

SHORT TERM ACTIVITY - MULTI HAZARD No. 4: Identify, improve, and sustain collaborative programs focusing on the real estate and insurance industries, public and private sector organizations, and individuals to avoid activity that increases risk to natural hazards.

Implementation:

- Distribute information about flood, fire, earthquake, and other forms of natural hazards insurance to property owners in areas identified to be at risk through hazard mapping.
- Develop a one-page handout on types of insurance and deliver through the City newsletter.
- Educate individuals and businesses on the benefit of engaging in mitigation activities such as developing impact analyses.
- Pinpoint areas of high risk and transfer the cost of risk to property owners through insurance (rather than to the public).
- Encourage the development of unifying organizations to ensure communication and dissemination of natural hazard mitigation information.

Multi hazard Action Items:

- Identify activities for private sector and citizen involvement such as nonstructural seismic daycare retrofits.

Coordinating Organization: City Planning Department

Time line: Ongoing

Plan Goals Addressed: Protect Life and Property, Public Awareness, Partnerships and Implementation

Deadline: To be determined (TBD)

SHORT TERM ACTIVITY - MULTI HAZARD No. 5: Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in City of Bradbury.

Implementation:

- Work with city governments to develop local Natural Hazard Mitigation Plans that are consistent with the goals and framework of the city plan.
- Identify all organizations within City of Bradbury that have programs or interests in natural Hazard mitigation.
- Involve local homeowner associations throughout the city in mitigation planning.
- Improve communication between CalTrans and city road departments, and work together to prioritize and identify strategies to deal with road problems.

- Establish protocol for communication and electric utility providers and the Department of Transportation and Development to assure rapid restoration of transportation capabilities.

Coordinating Organization: City Planning Department

Time line: Ongoing

Plan Goals Addressed: Partnerships and Implementation

Deadline: To be determined (TBD)

SHORT TERM ACTIVITY - MULTI HAZARD No. 6: Develop inventories of at-risk buildings and infrastructure and prioritize mitigation projects.

Implementation:

- Identify critical facilities at risk from natural hazards events.
- Develop strategies to mitigate risk to these facilities or to utilize alternative facilities should natural hazards events cause damages to the facilities in question.
- Identify bridges at risk from flood or earthquake hazards, identify enhancements, and implement projects needed to reduce the risks.

Coordinating Organization: City Planning Department

Time line: 1-2 Years

Plan Goals Addressed: Protect Life and Property, Partnerships and Implementation

Deadline: To be determined (TBD)

LONG TERM ACTIVITY - MULTI HAZARD No. 1: Strengthen emergency services preparedness and response by linking emergency services with natural hazard mitigation programs, and enhancing public education on a regional scale.

Implementation:

- Educate private property owners on limitations of bridges and dangers associated with them.
- Develop a process to encourage private property owners to upgrade their access roads and driveways to accommodate fire trucks and emergency vehicles.
- Encourage individual and family preparedness through public education projects such as safety fairs.
- Coordinate the maintenance of emergency evacuation routes through communication among the City Roads Department, neighboring jurisdictions, and the California Department of Transportation.
- Identify opportunities for partnering with citizens, private contractors, and other jurisdictions to increase availability of equipment and manpower for efficiency of response efforts.

- Work with Community Planning Organizations (CPO's) and other neighborhood groups to establish community response teams.
- Familiarize public officials of requirements regarding public assistance for disaster response.

Coordinating Organization: City Planning Department

Time line: Ongoing

Plan Goals Addressed: Emergency Services

Deadline: To be determined (TBD)

LONG TERM ACTIVITY - MULTI HAZARD No. 2: Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners and schools.

Implementation:

Multi hazard Action Items

- Make the City of Bradbury Natural Hazard Mitigation Plan available to the public by publishing the plan electronically on the city and emergency management websites.
- Enhance C-map capabilities by creating a website that includes information specific to City of Bradbury residents, including site-specific hazards information, Building & Safety Codes information, insurance companies that provide earthquake insurance for city residents, and educational information on damage prevention.
- Develop a web page to facilitate Internet discussions and information sharing.
- Develop and complete a baseline survey to gather perceptions of private citizens and the business community regarding natural hazard risks and identify mitigation needs. Repeat the survey in five years to monitor successes and failures of natural hazard mitigation programs.
- Develop adult and child educational programs to be used by local radio and cable television stations.
- Use local cable television facilities as a conduit for advertising public forums.
- Education: Develop curriculum for school programs and adult education on reducing risk and preventing loss from natural hazards.
- Conduct natural hazards awareness programs in schools and community centers.
- Conduct workshops for public and private sector organizations to raise awareness of mitigation activities and programs.
- Develop outreach materials for mitigation, preparedness, response and recovery.

Coordinating Organization: Public and Government Relations

Time line: Ongoing

Plan Goals Addressed: Public Awareness, Protect Life and Property

Deadline: To be determined (TBD)

LONG TERM ACTIVITY - MULTI HAZARD No. 3: Use technical knowledge of natural ecosystems and events to link natural resource management and land use organizations to mitigation activities and technical assistance.

Implementation:

- Review ordinances that protect natural systems and resources to mitigate for natural Hazard for possible enhancements.
- Pursue vegetation and restoration practices that assist in enhancing and restoring the natural and beneficial functions of the watershed.
- Develop education and outreach programs that focus on protecting natural systems as a mitigation activity.

Coordinating Organization: City Planning Department

Time line: Ongoing

Plan Goals Addressed: Natural Systems

Deadline: To be determined (TBD)

6.0 PLAN MAINTENANCE

The plan maintenance section of this document details the formal process that will ensure that the City of Bradbury Natural Hazard Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the city will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how the City of Bradbury intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the City General Plan, Capital Improvement Plans, and Building and Safety Codes.

6.1 Monitoring and Implementing the Plan

The City of Bradbury Hazard Mitigation Plan will be used to prioritize projects. Mitigation projects will be considered for funding through federal and state grant programs, and when other funds are made available to the City. The City Disaster Committee will be the coordinating agency for project implementation. The Bradbury Fire Department and Public Works Department will be responsible for mitigation project administration.

The City Disaster Committee and public will also review the risk assessment portion of the Plan to determine if this information should be updated or modified, given any newly available data. The list of critical facilities will also be reviewed and enhanced with additional details.

6.2 Plan Adoption

The City Council will be responsible for adopting the City of Bradbury Natural Hazard Mitigation Plan. This governing body has the authority to promote sound public policy regarding natural hazards. Once the plan has been adopted, the City Emergency Manager will be responsible for submitting it to the State Hazard Mitigation Officer at The Governor's Office of Emergency Services. The Governor's Office of Emergency Services will then submit the plan to the Federal Emergency Management Agency (FEMA) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, the City of Bradbury will gain eligibility for Hazard Mitigation Grant Program funds.

6.3 Coordinating Body

A City of Bradbury Hazard Mitigation Committee will be responsible for coordinating implementation of plan action items and undertaking the formal review process. The City Council will assign representatives from city agencies, including, but not limited to, the current Hazard Mitigation Advisory Committee members. The City has formed a Hazard Mitigation Committee that consists of members from local agencies, organizations, and citizens, and includes the following:

- City of Bradbury Finance
- City of Bradbury Fire Department
- City of Bradbury Planning Division
- City of Bradbury Public Information Officer
- County of Los Angeles Roads Division
- City of Bradbury Building and Safety Department
- County of Los Angeles Water and Environment Services
- California Division of Mines and Geology
- Federal Emergency Management Agency
- The Governor's Office of Emergency Services

In order to make this committee as broad and useful as possible, the City Manager will engage other relevant organizations and agencies in hazard mitigation. The recommendations for adding to the Hazard Mitigation Advisory Committee include:

- An elected official
- An insurance company representative
- Community Planning Organization representatives
- A representative from the City Manager's office
- A local Homeowners Association member
- A representative from the County of Los Angeles Council of Governments

The Hazard Mitigation Advisory Committee will meet no less than quarterly. Meeting dates will be scheduled once the final Hazard Mitigation Advisory Committee has been established. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan.

6.3 Convener

The City Council will adopt the City of Bradbury Natural Hazard Mitigation Plan and the Hazard Mitigation Advisory Committee will take responsibility for plan implementation. The City Manager will serve as a convener to facilitate the Hazard Mitigation Advisory Committee meetings and will assign tasks such as updating and presenting the Plan to the members of the committee. Plan implementation and evaluation will be a shared responsibility among all of the Natural Hazard Advisory Committee Members.

6.4 Implementation through Existing Programs

City of Bradbury addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Plans, and City Building and Safety Codes. The Natural Hazard Mitigation Plan provides a series of recommendations - many of which are closely related to the goals and objectives of existing planning programs. The City of Bradbury will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

The City of Bradbury Building & Safety Department is responsible for administering the Building & Safety Codes. In addition, the Hazard Advisory Committee will work with other agencies at the state level to review, develop and ensure Building & Safety Codes that are adequate to mitigate or prevent damage by natural Hazard. This is to ensure that life-safety criteria are met for new construction.

The goals and action items in the mitigation plan may be achieved through activities recommended in the City's Capital Improvement Plans (CIP). Various city departments develop CIP plans, and review them on an annual basis. Upon annual review of the CIPs, the Hazard Mitigation Advisory Committee will work with the city departments to identify areas that the hazard mitigation plan action items are consistent with CIP planning goals and integrate them where appropriate.

Within six months of formal adoption of the mitigation plan, the recommendations listed above will be incorporated into the process of existing planning mechanisms at the city level. The meetings of the Hazard Mitigation Advisory Committee will provide an opportunity for committee members to report back on the progress made on the integration of mitigation planning elements into city planning documents and procedures.

6.5 Economic Analysis of Mitigation Projects

FEMA's approaches to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis.

Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later.

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards can provide decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Given federal funding, the Hazard Mitigation Advisory Committee will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Hazard Mitigation Advisory Committee will use other approaches to understand the costs and benefits of each action item and develop a prioritized list.

6.6 Evaluating and Updating the Plan

The Plan will be maintained by formal process to ensure that the Bradbury Hazard Mitigation Plan remains an active and relevant document. The Plan maintenance process includes a schedule for monitoring and evaluating the Plan and producing a Plan revision every five years.

The Bradbury Hazard Mitigation Plan will be reviewed every year, or as deemed necessary by knowledge of new Hazard, vulnerabilities, or other pertinent reasons. The review will determine whether a Plan update is needed prior to the required five-year update. The Plan review will identify new mitigation projects and evaluate the effectiveness of mitigation priorities and existing programs.

The Bradbury Fire Department will be responsible for scheduling a meeting of the Bradbury City Disaster Committee every year to review and update the Plan as needed. The meeting will be open to the public and advertised in the local newspaper and local radio stations to solicit public input. The public will have the opportunity to review the goals and mitigation projects at these meetings, review changing hazard situations in the City, and changes in state or federal policy relating to this Plan to ensure that it addresses current and expected needs.

The Disaster Committee will develop status reports detailing the success of various mitigation projects, difficulties encountered, success of coordination efforts and which strategies should be revised. These status reports will be published on the Bradbury City web site and an executive summary will be published in the local newspaper to update the citizens of Bradbury.

The Bradbury Fire Department, with the assistance of other City Departments, will be responsible for the five-year update of the Plan, and will submit to the City Council and public for review and approval. Before the end of the five-year period, the updated Plan will be submitted to the State Hazard Mitigation Officer and the FEMA for acceptance. The Fire Department will notify all holders of the City Plan when changes have been made. Bradbury is dedicated to involving the public directly in review and updates of the Bradbury Hazard Mitigation Plan. Copies of the Plan will be catalogued and kept at all appropriate agencies in the City.

Public meetings will be held as part of each two-year review and the required five-year update of the Plan. Meetings of the City Council and public hearings will provide an opportunity for local officials to report back on the progress made on the integration of mitigation planning elements into City planning documents and procedures.

6.7 Formal Review Process

The City of Bradbury Natural Hazard Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and time line, and identifies the local agencies and organizations participating in plan evaluation. The convener or designee will be responsible for contacting the Hazard Mitigation Advisory Committee members and organizing the annual meeting.

Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The committee will review the goals and action items to determine their relevance to changing situations in the city, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the Plan to determine if this information should be updated or modified, given any new available data. The coordinating organizations responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised.

The convener will assign the duty of updating the plan to one or more of the committee members. The designated committee members will have three months to make appropriate changes to the Plan before submitting it to the Hazard Committee members, and presenting it to the City Council. The Hazard Mitigation Advisory Committee will also notify all holders of the city plan when changes have been made. Every five years the updated plan will be submitted to the State Hazard Mitigation Officer and the Federal Emergency Management Agency for review.

6.8 Continued Public Involvement

The City of Bradbury is dedicated to involving the public directly in review and updates of the Hazard Mitigation Plan. The Hazard Mitigation Committee members are responsible for the annual review and update of the plan.

The public will also have the opportunity to provide feedback about the Plan. Copies of the Plan will be catalogued and kept at all of the appropriate agencies in the city. The existence and location of these copies will be publicized in the City's website. The plan also includes the address and the phone number of the City Planning Division which is responsible for keeping track of public comments on the Plan.

In addition, copies of the plan and any proposed changes will be posted on the city website. This site will also contain an email address and phone number to which people can direct their comments and concerns.

A public meeting will also be held after each annual evaluation or when deemed necessary by the Hazard Mitigation Advisory Committee. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the Plan. The City Public Information Officer will be responsible for using city resources to publicize the annual public meetings and maintain public involvement through the public access channel, web page, and newspapers.

Natural Hazard Mitigation Plan (NHMP)

City of Bradbury
600 Winston Avenue
Bradbury, CA 91010

APPENDIX A

Mitigation Activities Matrix

Natural Hazard	SHORT TERM ACTIVITY - MULTI HAZARD No. 1		
Action Item	Integrate the goals and action items from the City of Bradbury Natural Hazard Mitigation Plan into existing regulatory documents and programs, where appropriate		
Coordinating Organization	Hazard Mitigation Advisory Committee		
Ideas for Implementation	<ul style="list-style-type: none"> • Use the mitigation plan to help the City’s General Plan institutionalize guidelines for sustainable development in all new construction and development projects according to the hazards that impact the City of Bradbury. • Integrate the City’s mitigation plan into current capital improvement plans to ensure that development does not encroach on known hazard areas: and • Partner with other organizations and agencies with similar goals to promote Building & Safety Codes that are more disaster resistant at the state level. 		
Time line	Ongoing		
Plan Goals Addressed			Protect Life and Property
	Public Awareness		Natural Systems
X	Partnerships and Implementation		Emergency Services

Natural Hazard	SHORT TERM ACTIVITY - MULTI HAZARD No. 2		
Action Item	Identify and pursue funding opportunities to develop and implement local and city mitigation activities.		
Coordinating Organization	Planning Department		
Ideas for Implementation	<ul style="list-style-type: none"> • Develop incentives for local governments, citizens, and businesses to pursue hazard mitigation projects. • Allocate city resources and assistance to mitigation projects when possible: and • Partner with other organizations and agencies in City of Bradbury to identify grant programs and foundations that may support mitigation activities. 		
Time line	Ongoing		
Plan Goals Addressed			Protect Life and Property
	Public Awareness		Natural Systems
X	Partnerships and Implementation		Emergency Services

Natural Hazard	SHORT TERM ACTIVITY - MULTI HAZARD No. 3		
Action Item	Establish a formal role for the City of Bradbury Natural Hazard Mitigation Committee to develop a sustainable process for implementing, monitoring, and evaluating citywide mitigation activities		
Coordinating Organization	Hazard Mitigation Advisory Committee		
Ideas for Implementation	<ul style="list-style-type: none"> • Establish clear roles for participants, meeting regularly to pursue and evaluate implementation of mitigation strategies. • Oversee implementation of the mitigation plan. • Establish measurable standards to evaluate mitigation policies and programs and provide a mechanism to update and revise the mitigation plan. • Monitor hazard mitigation implementation by jurisdictions and participating organizations through surveys and other reporting methods. • Develop updates for the Natural Hazards Mitigation Action Plan based on new information. • Conduct a full review of the Natural Hazards Mitigation Action Plan every 5 years by evaluating mitigation successes, failures, and areas that were not addressed. • Provide training for Committee members to remain current on developing issues in the natural hazard loss reduction field. 		
Time line	Ongoing		
Plan Goals Addressed			Protect Life and Property
	Public Awareness		Natural Systems
X	Partnerships and Implementation		Emergency Services

Natural Hazard	SHORT TERM ACTIVITY - MULTI HAZARD No. 4		
Action Item	Identify, improve, and sustain collaborative programs focusing on the real estate and insurance industries, public and private sector organizations, and individuals to avoid activity that increases risk to natural hazards.		
Coordinating Organization	City Planning Department		
Ideas for Implementation	<ul style="list-style-type: none"> • Distribute information about flood, fire, earthquake, and other forms of natural hazards insurance to property owners in areas identified to be at risk through hazard mapping. • Develop a one-page handout on types of insurance and deliver through city utility or service agencies. • Educate individuals and businesses on the benefit of engaging in mitigation activities such as developing impact analysis. • Pinpoint areas of high risk and transfer the cost of risk to property owners through insurance (rather than to the public). • Encourage the development of unifying organizations to ensure communication and dissemination of natural hazard mitigation information. • Identify activities for private sector and citizen involvement such as nonstructural seismic daycare retrofits. 		
Time line	Ongoing		
Plan Goals Addressed			Protect Life and Property

	Public Awareness		Natural Systems
X	Partnerships and Implementation		Emergency Services

Natural Hazard	SHORT TERM ACTIVITY - MULTI HAZARD No. 5		
Action Item	Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in City of Bradbury.		
Coordinating Organization	City Planning Department		
Ideas for Implementation	<ul style="list-style-type: none"> • Work with city governments to develop local Natural Hazard Mitigation Plans that are consistent with the goals and framework of the city plan. • Identify all organizations within City of Bradbury that have programs or interests in natural hazards mitigation. • Involve private businesses throughout the city in mitigation planning. • Improve communication between Cal Trans and City road departments, and work together to prioritize and identify strategies to deal with road problems. • Establish protocol for communication electric providers and the Department of Transportation and Development to assure rapid restoration of transportation capabilities. 		
Time line	Ongoing		
Plan Goals Addressed			Protect Life and Property
	Public Awareness		Natural Systems
X	Partnerships and Implementation		Emergency Services

Natural Hazard	SHORT TERM ACTIVITY - MULTI HAZARD No. 6		
Action Item	Develop inventories of at-risk buildings and infrastructure and prioritize mitigation projects.		
Coordinating Organization	City Planning Department		
Ideas for Implementation	<ul style="list-style-type: none"> • Identify critical facilities at risk from natural hazards events. • Develop strategies to mitigate risk to these facilities, or to utilize alternative facilities should natural hazards events cause damages to the facilities in question. • Identify bridges at risk from flood or earthquake hazards, identify enhancements, and implement projects needed to reduce the risks. 		
Time line	Ongoing		
Plan Goals Addressed			Protect Life and Property
	Public Awareness		Natural Systems
X	Partnerships and Implementation		Emergency Services

Natural Hazard	LONG TERM ACTIVITY - MULTI HAZARD No. 1		
Action Item	Strengthen emergency services preparedness and response by linking emergency services with natural hazard mitigation programs, and enhancing public education on a regional scale.		
Coordinating Organization	City Planning Department		
Ideas for Implementation	<ul style="list-style-type: none"> • Educate private property owners on limitations of bridges and dangers associated with them. • Develop a process to encourage private property owners to upgrade their bridges to support weight of fire trucks and emergency vehicles. • Encourage individual and family preparedness through public education projects such as safety fairs. • Coordinate the maintenance of emergency transportation routes though communication among the City Roads Department, neighboring jurisdictions, and the California Department of Transportation. • Identify opportunities for partnering with citizens, private contractors, and other jurisdictions to increase availability of equipment and manpower for efficiency of response efforts. • Work with Community Planning Organizations (CPO's) and other neighborhood groups to establish community response teams. • Familiarize public officials of requirements regarding public assistance for disaster response. 		
Time line	Ongoing		
Plan Goals Addressed			Protect Life and Property
	Public Awareness		Natural Systems
	Partnerships and Implementation	X	Emergency Services

Natural Hazard	LONG TERM ACTIVITY - MULTI HAZARD No. 2		
Action Item	Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners, businesses, and schools.		
Coordinating Organization	Public and Government Relations		
Ideas for Implementation	<ul style="list-style-type: none"> • Make the City of Bradbury Natural Hazard Mitigation Plan available to the public by publishing the plan electronically on the city and emergency management websites. • Enhance C-map capabilities by creating a website that includes information specific to City of Bradbury residents, including site-specific hazards information, Building & Safety Codes information, insurance companies that provide earthquake insurance for city residents, and educational information on damage prevention. • Develop a web page to facilitate Internet discussions and information sharing. • Develop and complete a baseline survey to gather perceptions of private citizens and the business community regarding natural hazard risks and identify mitigation needs. Repeat the survey in five years to monitor successes and failures of natural hazard mitigation programs. • Develop outreach programs to business organizations that must prepare for flooding events. • Develop adult and child educational programs to be used by local radio and cable television stations. 		

	<ul style="list-style-type: none"> • Use local radio and cable stations as a conduit for advertising public forums. • Education: Develop curriculum for school programs and adult education on reducing risk and preventing loss from natural hazards. • Conduct natural hazards awareness programs in schools and community centers. • Conduct workshops for public and private sector organizations to raise awareness of mitigation activities and programs. • Develop outreach materials for mitigation, preparedness, response and recovery.
Time line	Ongoing
Plan Goals Addressed	X Protect Life and Property
X Public Awareness	Natural Systems
Partnerships and Implementation	Emergency Services

Natural Hazard	LONG TERM ACTIVITY - MULTI HAZARD No. 3		
Action Item	Use technical knowledge of natural ecosystems and events to link natural resource management and land use organizations to mitigation activities and technical assistance.		
Coordinating Organization	City Planning Department		
Ideas for Implementation	<ul style="list-style-type: none"> • Review ordinances that protect natural systems and resources to mitigate for natural hazards for possible enhancements. • Pursue vegetation and restoration practices that assist in enhancing and restoring the natural and beneficial functions of the watershed. • Develop education and outreach programs that focus on protecting natural systems as a mitigation activity. 		
Time line	Ongoing		
Plan Goals Addressed			Protect Life and Property
	Public Awareness	X	Natural Systems
	Partnerships and Implementation		Emergency Services

Natural Hazard Mitigation Plan (NHMP)

City of Bradbury
600 Winston Avenue
Bradbury, California 91010

APPENDIX B

The Public Participation Process

Public participation is a key component to strategic planning processes. Citizen participation offers citizens the chance to voice their ideas, interests, and opinions. The Federal Emergency Management Agency also requires public input during the development of mitigation plans.

The City of Bradbury Natural Hazards Mitigation Plan integrates a cross-section of citizen input throughout the planning process. To accomplish this goal, the City of Bradbury Disaster Management Area Coordinators developed a public participation process through three components: (1) developing a project steering committee comprised of knowledgeable individuals representative of the community; (2) conducting stakeholder interviews to target the specialized knowledge of individuals working with populations or areas at risk from natural hazards; and (3) conducting two public workshops to identify common concerns and ideas regarding hazard mitigation and to discuss specific goals and actions of the mitigation plan.

Integrating public participation during the development of the City of Bradbury Natural Hazards Mitigation Plan has ultimately resulted in increased public awareness. Through citizen involvement, the mitigation plan reflects community issues, concerns, and new ideas and perspectives on mitigation opportunities and plan action items.

Steering Committee

Hazard mitigation in City of Bradbury is overseen by the Bradbury Disaster Management Area Coordinators Hazard Mitigation Advisory Committee, which consists of representatives from various city departments, representatives from local business and community organizations and the public. Steering committee members have an understanding of how the community is structured and how residents, businesses, and the environment may be affected by natural hazard events. The steering committee guided the development of the plan, and assisted in developing plan goals and action items, identifying stakeholders, and sharing local expertise to create a more comprehensive plan.

Table B.1 lists the various people and organizations that participated on the City of Bradbury Natural Hazard Mitigation Planning Committee.

Table B.1. Hazard Mitigation Planning Committee

Project Steering Committee:
- City of Bradbury Building and Safety Official
- City of Emergency Services Coordinator

- City of Bradbury Finance Director
- City of Bradbury City Planner
- City of Bradbury Public Information Officer
- City of Bradbury City Manager
- County of Los Angeles Sheriff's Department
- County of Los Angeles Fire Department
- County of Los Angeles Roads Division
- City of Bradbury Community Services Department

Public Meetings

City of Bradbury coordinated two public workshops in the City to gather public ideas and opinions about the mitigation plan goals and activities.

First Public Workshop: July 28, 2004

The first public workshop provided information on the mitigation plan to workshop participants and garnered input on issues related to natural hazards in the community.

Invitation Process

The City Planner identified all possible public notice sources. A press release was submitted to the Homeowner Associations, local daily and weekly print media. Additionally, the chairperson sent letters of invitation to all city home owner associations.

Results

The City Planner began the presentation by providing an overview of workshop objectives to the participants. The citizens and steering committee members broke into two small groups. Each group began with introductions, and then discussed their thoughts on the plan goals. The groups then discussed some of the hazards or disasters they had personally experienced in the past and activities that might prevent damages from natural hazards in the future. The group process took approximately 50 minutes.

Second Public Workshop: August 25, 2004

City of Bradbury held the second public workshop to gather public input on issues related to natural hazards in the city, as well as ideas for strategies to reduce risk. The workshop was successful in attaining public input.

Invitation Process

The City Planner identified all possible public notice sources. A press release was submitted to the Homeowner Associations, local daily and weekly print media. Additionally, the chairperson sent letters of invitation to all city home owner associations.

The City Planner began the presentation by providing an overview of workshop objectives to the participants. The citizens and steering committee members broke into two small groups. Each group began with introductions, and then discussed their thoughts on the plan goals. The groups then discussed some of the hazards or disasters they had personally experienced in the past and activities that might prevent damages from natural hazards in the future. The group process took approximately 45 minutes.

**Natural Hazard Mitigation Plan
(NHMP)**

City of Bradbury
600 Winston Avenue
Bradbury, CA 91010

APPENDIX C

Project Evaluation Worksheet

Project Evaluation Worksheet

Jurisdiction:		Contact:	
Project Title		Phone:	
Agency:		E-mail:	
Hazard(s):			
Flood Zone:		Base Flood Elevation:	Erosion Rate:
Critical Facility/Population At Risk:			
Environmental Impact:		Historic Preservation Impact:	
High	Medium	Low	High
High	Medium	Low	High
Importance to Protection of Life/Property and Disaster Recovery		Risk of Hazard Impact:	
High	Medium	Low	High
High	Medium	Low	High
Estimated Cost:		Project Duration:	
Value of Facility:		Value of Contents:	
Source(s) of Financing:			
Project Objectives:			
Project Description:			
Proposal Date:			
Evaluation Category	Considerations		Comments
Social	Community Acceptance		
	Adversely Affects Segments of the Population		
Technical	Technical Feasibility		
	Long Term Solution		
	Secondary Impacts		
Administrative	Staffing		
	Funding Allocated		
	Maintenance / Operations		
Political	Political Support		
	Plan Proponent		
	Public Support		
Legal	Authority		
	Action Subject to Legal Challenge		
Economic	Benefit		
	Cost of Action		
	Contributes to Economic Goals		
	Outside Funding Required		
Environmental	Affects Land / Water Bodies		
	Affects Endangered Species		
	Affects Hazardous Materials and Waste Sites		
	Consistent with Community Environmental Goals		
	Consistent with Federal Laws		

Natural Hazard Mitigation Plan (NHMP)

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APPENDIX D

Acronyms

Federal Acronyms

AASHTO	American Association of State Highway and Transportation Officials
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BSSC	Building Seismic Safety Council
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CRS	Community Rating System
EDA	Economic Development Administration
EPA	Environmental Protection Agency
ER	Emergency Relief
EWP	Emergency Watershed Protection (NRCS Program)
FAS	Federal Aid System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance (FEMA Program)
FTE	Full Time Equivalent
GIS	Geographic Information System
GNS	Institute of Geological and Nuclear Sciences (International)
GSA	General Services Administration
HAZUS	Hazards U.S.
HMGP	Hazard Mitigation Grant Program
HMST	Hazard Mitigation Survey Team
HUD	Housing and Urban Development (United States, Department of)
IBHS	Institute for Business and Home Safety
ICC	Increased Cost of Compliance
IHMT	Interagency Hazard Mitigation Team
NCDC	National Climate Data Center
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHMP	Natural Hazard Mitigation Plan (also known as "409 Plan")
NIBS	National Institute of Building Sciences
NIFC	National Interagency Fire Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
SBA	Small Business Administration
SEAO	Structural Engineers Association of Oregon
SHMO	State Hazard Mitigation Officer
TOR	Transfer of Development Rights

UGB	Urban Growth Boundary
URM	Unreinforced Masonry
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFA	United States Fire Administration
USFS	United States Forest Service
USGS	United States Geological Survey
WSSPC	Western States Seismic Policy Council

California Acronyms

A&W	Alert and Warning
AA	Administering Areas
AAR	After Action Report
ARC	American Red Cross
ARP	Accidental Risk Prevention
ATC20	Applied Technology Council20
ATC21	Applied Technology Council21
BCP	Budget Change Proposal
BSA	California Bureau of State Audits
CAER	Community Awareness & Emergency Response
CalARP	California Accidental Release Prevention
CalBO	California Building Officials
CalEPA	California Environmental Protection Agency
CalREP	California Radiological Emergency Plan
CALSTARS	California State Accounting Reporting System
CalTRANS	California Department of Transportation
CBO	Community Based Organization
CD	Civil Defense
CDF	California Department of Forestry and Fire Protection
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEPEC	California Earthquake Prediction Evaluation Council
CESRS	California Emergency Services Radio System
CHIP	California Hazardous Identification Program
CHMIRS	California Hazardous Materials Incident Reporting System
CHP	California Highway Patrol
CLETS	California Law Enforcement Telecommunications System
CSTI	California Specialized Training Institute
CUEA	California Utilities Emergency Association
CUPA	Certified Unified Program Agency
DAD	Disaster Assistance Division (of the state Office of Emergency Svcs)
DFO	Disaster Field Office

DGS	California Department of General Services
DHSRHB	California Department of Health Services, Radiological Health Branch
DO	Duty Officer
DOC	Department Operations Center
DOE	Department of Energy (U.S.)
DOF	California Department of Finance
DOJ	California Department of Justice
DPA	California Department of Personnel Administration
DPIG	Disaster Preparedness Improvement Grant
DR	Disaster Response
DSA	Division of the State Architect
DSR	Damage Survey Report
DSW	Disaster Service Worker
DWR	California Department of Water Resources
EAS	Emergency Alerting System
EDIS	Emergency Digital Information System
EERI	Earthquake Engineering Research Institute
EMA	Emergency Management Assistance
EMI	Emergency Management Institute
EMMA	Emergency Managers Mutual Aid
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency (U.S.)
EPEDAT	Early Post Earthquake Damage Assessment Tool
EPI	Emergency Public Information
EPIC	Emergency Public Information Council
ESC	Emergency Services Coordinator
FAY	Federal Award Year
FDAA	Federal Disaster Assistance Administration
FEAT	Governor's Flood Emergency Action Team
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FIR	Final Inspection Reports
FIRESCOPE	Firefighting Resources of So. Calif Organized for Potential Emergencies
FMA	Flood Management Assistance
FSR	Feasibility Study Report
FY	Fiscal Year
GIS	Geographical Information System
HAZMAT	Hazardous Materials
HAZMIT	Hazardous Mitigation
HAZUS	Hazards United States (an earthquake damage assessment prediction tool)
HAD	Housing and Community Development
HEICS	Hospital Emergency Incident Command System
HEPG	Hospital Emergency Planning Guidance

HIA	Hazard Identification and Analysis Unit
HMEP	Hazardous Materials Emergency Preparedness
HMGP	Hazard Mitigation Grant Program
IDE	Initial Damage Estimate
IA	Individual Assistance
IFG	Individual & Family Grant (program)
IRG	Incident Response Geographic Information System
IPA	Information and Public Affairs (of state Office of Emergency Services)
LAN	Local Area Network
LEMMA	Law Enforcement Master Mutual Aid
LEPC	Local Emergency Planning Committee
MARAC	Mutual Aid Regional Advisory Council
MHID	Multihazard Identification
MOU	Memorandum of Understanding
NBC	Nuclear, Biological, Chemical
NEMA	National Emergency Management Agency
NEMIS	National Emergency Management Information System
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Association
NPP	Nuclear Power Plant
NSF	National Science Foundation
NWS	National Weather Service
OA	Operational Area
OASIS	Operational Area Satellite Information System
OCC	Operations Coordination Center
OCD	Office of Civil Defense
OEP	Office of Emergency Planning
OES	California Governor's Office of Emergency Services
OSHPD	Office of Statewide Health Planning and Development
OSPR	Oil Spill Prevention and Response
PA	Public Assistance
PC	Personal Computer
PDA	Preliminary Damage Assessment
PIO	Public Information Office
POST	Police Officer Standards and Training
PPA/CA	Performance Partnership Agreement/Cooperative Agreement (FEMA)
PSA	Public Service Announcement
PTAB	Planning and Technological Assistance Branch
PTR	Project Time Report
RA	Regional Administrator (OES)
RADEF	Radiological Defense (program)
RAMP	Regional Assessment of Mitigation Priorities
RAPID	Railroad Accident Prevention & Immediate Deployment
RDO	Radiological Defense Officer
RDMHC	Regional Disaster Medical Health Coordinator

REOC	Regional Emergency Operations Center
REPI	Reserve Emergency Public Information
RES	Regional Emergency Staff
RIMS	Response Information Management System
RMP	Risk Management Plan
RPU	Radiological Preparedness Unit (OES)
RRT	Regional Response Team
SAM	State Administrative Manual
SARA	Superfund Amendments & Reauthorization Act
SAVP	Safety Assessment Volunteer Program
SBA	Small Business Administration
SCO	California State Controller's Office
SEMS	Standardized Emergency Management System
SEPIC	State Emergency Public Information Committee
SLA	State and Local Assistance
SONGS	San Onofre Nuclear Generating Station
SOP	Standard Operating Procedure
SWEPC	Statewide Emergency Planning Committee
TEC	Travel Expense Claim
TRU	Transuranic
TTT	Train the Trainer
UPA	Unified Program Account
UPS	Uninterrupted Power Source
USAR	Urban Search and Rescue
USGS	United States Geological Survey
WC	California State Warning Center
WAN	Wide Area Network
WIPP	Waste Isolation Pilot Project

Natural Hazard Mitigation Plan (NHMP)

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APPENDIX E

Glossary

Acceleration	The rate of change of velocity with respect to time. Acceleration due to gravity at the earth's surface is 9.8 meters per second squared. That means that every second that something falls toward the surface of earth its velocity increases by 9.8 meters per second.
Asset	Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.
Base Flood	Flood that has a 1 percent probability of being equaled or exceeded in any given year. Also known as the 100-year flood.
Base Flood Elevation (BFE)	Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The Base Flood Elevation is used as the standard for the National Flood Insurance Program.
Bedrock	The solid rock that underlies loose material, such as soil, sand, clay, or gravel.
Building	A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.
Coastal High Hazard Area	Area, usually along an open coast, bay, or inlet, that is subject to inundation by storm surge and, in some instances, wave action caused by storms or seismic sources.
Coastal Zones	The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas having direct drainage to the ocean.
Community Rating System (CRS)	An NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of policyholders in these communities are reduced.
Computer-Aided Design And Drafting (CADD)	A computerized system enabling quick and accurate electronic 2-D and 3-D drawings, topographic mapping, site plans, and profile/cross-section drawings.
Contour	A line of equal ground elevation on a topographic (contour) map.

Critical Facility	Facilities that are critical to the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.
Debris	The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.
Digitize	To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse mercator (UTM), or table coordinates) for use in computer applications.
Displacement Time	The average time (in days) which the building's occupants typically must operate from a temporary location while repairs are made to the original building due to damages resulting from a hazard event.
Duration	How long a hazard event lasts.
Earthquake	A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.
Erosion	Wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.
Erosion Hazard Area	Area anticipated to be lost to shoreline retreat over a given period of time. The projected inland extent of the area is measured by multiplying the average annual long-term recession rate by the number of years desired.
Essential Facility	Elements that are important to ensure a full recovery of a community or state following a hazard event. These would include: government functions, major employers, banks, schools, and certain commercial establishments, such as grocery stores, hardware stores, and gas stations.
Extent	The size of an area affected by a hazard or hazard event.
Extratropical Cyclone	Cyclonic storm events like Nor'easters and severe winter low-pressure systems. Both West and East coasts can experience these non-tropical storms that produce gale-force winds and precipitation in the form of heavy rain or snow. These cyclonic storms, commonly called Nor'easters on the East Coast because of the direction of the storm winds, can last for several days and can be very large – 1,000-mile wide storms are not uncommon.

Fault	A fracture in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are differentially displaced parallel to the plane of fracture.
Federal Emergency Management Agency (FEMA)	Independent agency created in 1978 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response and recovery.
Fire Potential Index (FPI)	Developed by USGS and USFS to assess and map fire hazard potential over broad areas. Based on such geographic information, national policy makers and on-the-ground fire managers established priorities for prevention activities in the defined area to reduce the risk of managed and wildfire ignition and spread. Prediction of fire hazard shortens the time between fire ignition and initial attack by enabling fire managers to pre-allocate and stage suppression forces to high fire risk areas.
Flash Flood	A flood event occurring with little or no warning where water levels rise at an extremely fast rate.
Flood	A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.
Flood Depth	Height of the flood water surface above the ground surface.
Flood Elevation	Elevation of the water surface above an established datum, e.g. National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or Mean Sea Level.
Flood Hazard Area	The area shown to be inundated by a flood of a given magnitude on a map.
Flood Insurance Rate Map (FIRM)	Map of a community, prepared by the Federal Emergency Management Agency, that shows both the special flood hazard areas and the risk premium zones applicable to the community.
Flood Insurance Study (FIS)	A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.
Floodplain	Any land area, including watercourse, susceptible to partial or complete inundation by water from any source.

Frequency	A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1 percent chance – its probability – of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.
Fujita Scale of Tornado Intensity	Rates tornadoes with numeric values from F0 to F5 based on tornado windspeed and damage sustained. An F0 indicates minimal damage such as broken tree limbs or signs, while an F5 indicates severe damage sustained.
Functional Downtime	The average time (in days) during which a function (business or service) is unable to provide its services due to a hazard event.
Geographic Area Impacted	The physical area in which the effects of the hazard are experienced.
Geographic Information Systems (GIS)	A computer software application that relates physical features on the earth to a database to be used for mapping and analysis.
Ground Motion	The vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter, but soft soils can further amplify ground motions.
Hazard	A source of potential danger or adverse condition. Hazards in this how to series will include naturally occurring events such as floods, earthquakes, tornadoes, tsunamis, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.
Hazard Event	A specific occurrence of a particular type of hazard.
Hazard Identification	The process of identifying hazards that threaten an area.
Hazard Mitigation	Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.
Hazard Profile	A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

HAZUS (Hazards U.S.)	A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA.
Hurricane	An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74-miles-per-hour or more and blow in a large spiral around a relatively calm center or "eye." Hurricanes develop over the north Atlantic Ocean, northeast Pacific Ocean, or the south Pacific Ocean east of 160°E longitude. Hurricane circulation is counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.
Hydrology	The science of dealing with the waters of the earth. A flood discharge is developed by a hydrologic study.
Infrastructure	Refers to the public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities, and includes an area's transportation system such as airports, heliports; highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, drydocks, piers and regional dams.
Intensity	A measure of the effects of a hazard event at a particular place.
Landslide	Downward movement of a slope and materials under the force of gravity.
Lateral Spreads	Develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies in a seismic event. The phenomenon that occurs when ground shaking causes loose soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength.
Liquefaction	Results when the soil supporting structures liquefies. This can cause structures to tip and topple.
Lowest Floor	Under the NFIP, the lowest floor of the lowest enclosed area (including basement) of a structure.
Magnitude	A measure of the strength of a hazard event. The magnitude (also referred to as severity) of a given hazard event is usually determined using technical measures specific to the hazard.

Mitigation Plan	A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the state and includes a description of actions to minimize future vulnerability to hazards.
National Flood Insurance Program (NFIP)	Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 CFR §60.3.
National Geodetic Vertical Datum of 1929 (NGVD)	Datum established in 1929 and used in the NFIP as a basis for measuring flood, ground, and structural elevations, previously referred to as Sea Level Datum or Mean Sea Level. The Base Flood Elevations shown on most of the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency are referenced to NGVD.
National Weather Service (NWS)	Prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and state entities in preparing weather and flood warning plans.
Nor'easter	An extra-tropical cyclone producing gale-force winds and precipitation in the form of heavy snow or rain.
Outflow	Follows water inundation creating strong currents that rip at structures and pound them with debris, and erode beaches and coastal structures.
Planimetric	Describes maps that indicate only man-made features like buildings.
Planning	The act or process of making or carrying out plans; the establishment of goals, policies and procedures for a social or economic unit.
Probability	A statistical measure of the likelihood that a hazard event will occur.
Recurrence Interval	The time between hazard events of similar size in a given location. It is based on the probability that the given event will be equaled or exceeded in any given year.
Repetitive Loss Property	A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least \$1000 each have been paid within any 10-year period since 1978.
Replacement Value	The cost of rebuilding a structure. This is usually expressed in terms of cost per square foot, and reflects the present-day cost of labor and materials to construct a building of a particular size, type and quality.
Richter Scale	A numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935.

Risk	The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.
Riverine	Of or produced by a river.
Scale	A proportion used in determining a dimensional relationship; the ratio of the distance between two points on a map and the actual distance between the two points on the earth's surface.
Scarp	A steep slope.
Scour	Removal of soil or fill material by the flow of flood waters. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.
Seismicity	Describes the likelihood of an area being subject to earthquakes.
Special Flood Hazard Area (SFHA)	An area within a floodplain having a 1 percent or greater chance of flood occurrence in any given year (100-year floodplain); represented on Flood Insurance Rate Maps by darkly shaded areas with zone designations that include the letter A or V.
Stafford Act	The Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-107 was signed into law November 23, 1988 and amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.
State Hazard Mitigation Officer (SHMO)	The representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and postdisaster mitigation activities.
Storm Surge	Rise in the water surface above normal water level on the open coast due to the action of wind stress and atmospheric pressure on the water surface.
Structure	Something constructed. (See also Building)
Substantial Damage	Damage of any origin sustained by a structure in a Special Flood Hazard Area whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage.

Super Typhoon	A typhoon with maximum sustained winds of 150 mph or more.
Surface Faulting	The differential movement of two sides of a fracture – in other words, the location where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults.
Tectonic Plate	Torsionally rigid, thin segments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity.
Topographic	Characterizes maps that show natural features and indicate the physical shape of the land using contour lines. These maps may also include manmade features.
Tornado	A violently rotating column of air extending from a thunderstorm to the ground.
Tropical Cyclone	A generic term for a cyclonic, low-pressure system over tropical or subtropical waters.
Tropical Depression	A tropical cyclone with maximum sustained winds of less than 39 mph.
Tropical Storm	A tropical cyclone with maximum sustained winds greater than 39 mph and less than 74 mph.
Tsunami	Great sea wave produced by submarine earth movement or volcanic eruption.
Typhoon	A special category of tropical cyclone peculiar to the western North Pacific Basin, frequently affecting areas in the vicinity of Guam and the North Mariana Islands. Typhoons whose maximum sustained winds attain or exceed 150 mph are called super typhoons.
Vulnerability	Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power – if an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect effects can be much more widespread and damaging than direct ones.
Vulnerability Assessment	The extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.

Water Displacement	When a large mass of earth on the ocean bottom sinks or uplifts, the column of water directly above it is displaced, forming the tsunami wave. The rate of displacement, motion of the ocean floor at the epicenter, the amount of displacement of the rupture zone, and the depth of water above the rupture zone all contribute to the intensity of the tsunami.
Wave Runup	The height that the wave extends up to on steep shorelines, measured above a reference level (the normal height of the sea, corrected to the state of the tide at the time of wave arrival).
Wildfire	An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.
Zone	A geographical area shown on a Flood Insurance Rate Map (FIRM) that reflects the severity or type of flooding in the area.

**Natural Hazard Mitigation Plan
(NHMP)**

City of Bradbury
600 Winston Avenue
Bradbury, CA 91010

APPENDIX F

Notice of Preparation

Notice of Preparation of Natural Hazard Mitigation Plan

June 1, 2004

Dear Interested Parties:

The City of Bradbury is preparing a state and federal mandated Natural Hazard Mitigation Plan. The **Disaster Mitigation Act of 2000** (Public Law 106-390) states that for a community to receive pre-disaster mitigation funds and also Federal Emergency Management Funds, a Hazard Mitigation Plan must be submitted to the State and also to FEMA. Failure to submit an adequate plan by 2004 will disqualify a community from receiving disaster assistance until November 2005.

Plan goals are as follows:

Protect Life and Property

Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural hazards.

Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards.

Improve hazard assessment information to make recommendations for discouraging new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural hazards.

Public Awareness

Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

Provide information on tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.

Natural Systems

Balance natural resource management, and land use planning with natural hazard mitigation to protect life, property, and the environment.

Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions.

Partnerships and Implementation

Strengthen communication and coordinate participation among and within public agencies, citizens, non-profit organizations, business, and industry to gain a vested interest in implementation.

Encourage leadership within public and private sector organizations to prioritize and implement local and regional hazard mitigation activities.

Emergency Services

Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.

Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.

Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

To achieve above goals, a mitigation plan must be prepared and submitted by to the State Emergency Management Agency by November, 2004. A steering committee composed of several city divisions and departments was formed to draft the plan and have it adopted by the Bradbury Planning Commission and City Council.

Participation of community groups, businesses, government agencies, non-profit organizations, educational institutions, and the general public is an important aspect of the Mitigation Plan. We hereby invite the public to review our draft plan and inspire us with new ideas.

To learn more about the Plan and future meeting time, please contact me at (626) 358-3218.

Sincerely,
David Meyer
Plan Coordinator

