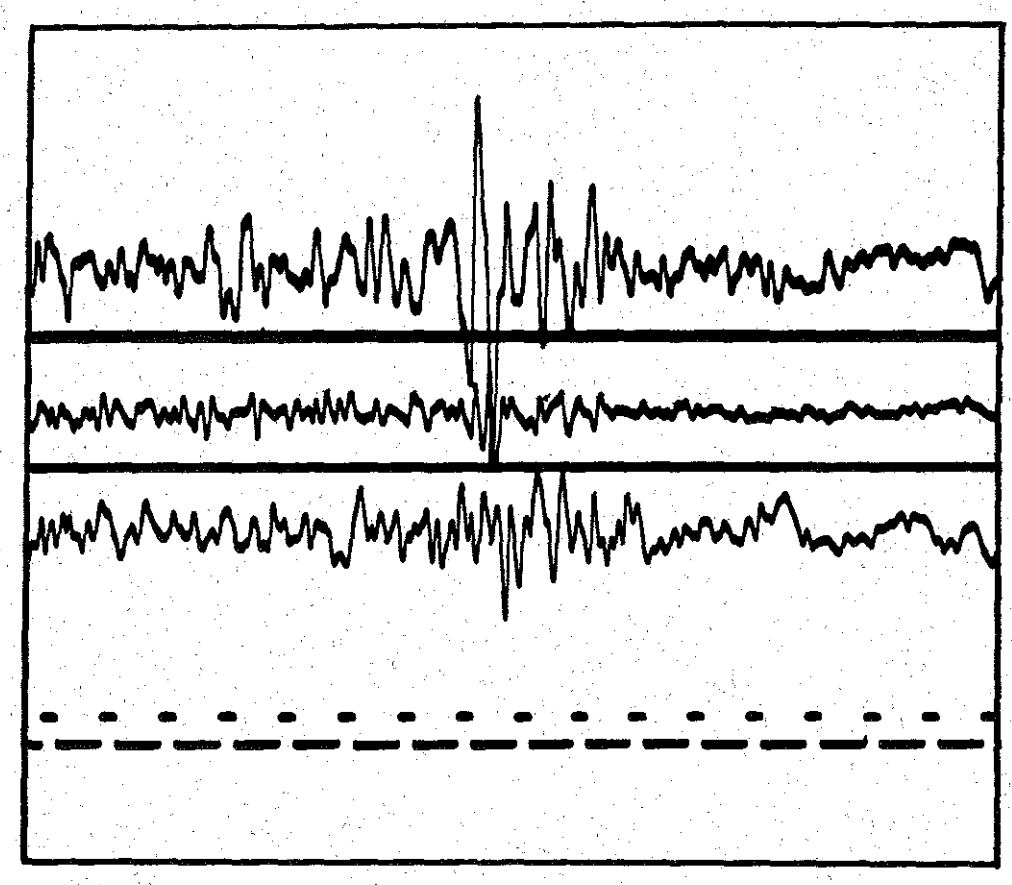
SAFETY ELEMENT OF THE GENERAL PLAN



CITY OF SANTA MONICA, CALIFORNIA

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SAFETY ELEMENT
FOR THE
CITY OF SANTA MONICA GENERAL PLAN

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SAFETY ELEMENT

In compliance with California State law, the City of Santa Monica has prepared a revised Safety Element of their General Plan. The Safety Element presented in the following pages combines the formerly required Safety and Seismic Safety elements into one comprehensive document, in accordance with State Government Section 65302(g). This Section, adopted in 1986, requires each local government to maintain a comprehensive Safety Element that addresses a variety of natural and human-related hazards, and that contain goals and policies aimed at reducing the risk associated with these hazards.

The Safety Element serves the following functions:

- Provides an accurate and up-to-date assessment of natural and human-related hazards in the City, including, but not limited to, earthquakes, landslides, subsidence/settlement, inundation, fire, and release of hazardous materials;
- provides a framework by which safety considerations are introduced into the land use planning process;
- Recommends amendments to the City Municipal Code, and the project review and permitting processes, by facilitating the identification and mitigation of hazards for new development;
- provides policies directed at identifying and reducing hazards in existing development; and
- strengthens earthquake, inundation, fire and hazardous materials preparedness planning and post-disaster reconstruction policies particular to the City of Santa Monica.

The Safety Element is only one component of the General Plan. Although the basic objective of the Element is to "reduce death, injuries, property damage, and economic and social impact from hazards", other social, economic, political and aesthetic factors must be considered and balanced with safety needs. Additional guidelines and standards can be introduced through the City's Municipal Codes. Zoning ordinances, and development/redevelopment regulations also support regulatory codes, and safety is protected as the City carries out its responsibilities under the California Environmental Quality Act (CEQA).

The following is a summary of the findings contained in the Technical Background Report for which safety planning issues need to be addressed:

- The City is at risk from strong ground motion from a number of nearby seismically active faults. Potential damage to new and most existing development will be slight to moderate; however, localized severe damage to vulnerable buildings may occur. Given the risk, critical facilities must be designed and maintained with a greater safety margin than that of conventional development.
- A major earthquake on the Newport-Inglewood, Santa Monica, or Malibu Coast faults has the potential for setting into motion multiple events, including injuries, crowd control

problems, blocked roads, hazardous materials releases, isolated structural damage, and fires. A major earthquake on the Newport-Inglewood fault is a probable worst-case scenario for the City of Santa Monica and must be considered in the ongoing development of the Multi-Hazard Functional Plan (MHFP).

- A truly worst case scenario would be a major ground rupturing earthquake on the Santa Monica fault. All utility lines crossing the fault would be ruptured and hundreds of structures destroyed. Fire suppression access north of the fault would be severely restricted, as would water flow to the main portions of the City, since most reservoirs are located within the elevated areas north of the fault.

- Shallow ground water within 50 feet of the ground surface reportedly occurs along the beach, and near the northern industrial corridor and Marine Park area of the City. This ground water condition, coupled with unconsolidated youthful sediment makes these areas susceptible to liquefaction during moderate to strong earthquakes.

- Surficial instability will continue to pose constraints to new development and enlargement of existing development in proximity to the bluff areas beneath or adjacent to the Palisades Park area.

- Failure of the Riviera and Stone Canyon reservoirs may affect portions of the City.

- Due to the extensive storm drain system, flooding due to heavy periods of rainfall is not expected to impact the City. However, storm-induced beach erosion will continue to impact the coastal areas of the City.

- Wild fire hazards in the City are considered non-existent, however, structural fires will continue to be a danger within the City. Urban brushland interface problems relating to fires is limited to the northern side of the City limits. This heavy brush area (between Los Angeles and Santa Monica) leaves structures in Santa Monica vulnerable to fire hazards.

- Hazardous material releases in or near the City may result in widespread impact to the population and environment. However, response plans and evacuation procedures required under California law are currently in place at facilities within the City that handle extremely hazardous and hazardous materials.

- Rupture of the crude oil pipeline extending through the City as a result of seismic activity, could result in a large hazardous material release effecting local populations or the environment.

- Abandoned landfills within the City pose additional hazardous waste concerns, as well as settlement/subsidence hazards.

- Tsunami inundation poses a hazard to low lying, near coastal environments within the City.

1.1 RELATION TO OTHER ELEMENTS

The Safety Element needs to be consistent with other elements of the General Plan, complementing the goals and policies of related elements. The Circulation Element emphasizes transportation issues, which is relevant to the Safety Element in that efficient traffic flow benefits emergency response or evacuation objectives. A relationship also exists with the Land Use Element; safety must be considered during planning for urban density and zoning designations. Safety and welfare of the public are priorities, however, social, economic, political and aesthetic factors also need to be considered and balanced with safety needs. Therefore, rather than competing with the goals and policies of related elements, this Safety Element has been designed to impart safety considerations within typical planning processes and is consistent with other General Plan policies.

1.2 ENVIRONMENTAL SETTING

The City of Santa Monica is located on the California coast within the Los Angeles basin. Many of the safety issues addressed in this document are directly related to southern California's seismic setting, while other issues are particular to the distinctive geologic and topographic setting of coastal regions. Southern California is located in one of the more seismically-active regions of the world, experiencing on average, an earthquake of magnitude 4.0 or greater every four years. The City of Santa Monica is located within a transition region between strike-slip faulting, characterized by the San Andreas and Newport-Inglewood fault systems, and reverse faulting along the Sierra Madre, San Fernando, San Gabriel and Hollywood-Santa Monica fault systems. This transition is accommodated by compressional movement on a series of east-west trending fold and fault belts, including the Elysian Park fold and thrust belt that extends under the City, and includes the Santa Monica fault system.

Surficial deposits in the City of Santa Monica consist predominantly of Pleistocene and Holocene-age alluvial and beach deposits. The topography consists of a gently southward sloping alluvial plain, rising from sea-level at the coast to approximately 375 feet in the northeastern portion (Franklin Hill area) of the City. Steep sea cliffs averaging ± 100 feet in vertical height are present along the northern two-thirds of the coastline. These sea cliffs expose continental and marine terrace deposits within approximately the upper half of the bluff, while a accumulation of talus deposits mantles the lower half of the bluff.

The City has green-belt areas and parks throughout the City. However, there is the risk of fire posed by urban brushland interface along Adelaide Avenue.

1.3 GROWTH PATTERNS AND TRENDS

Santa Monica is a stable, built-out community with residential and commercial districts. Having its inception in the nineteenth century, Santa Monica experienced its greatest population growth in the early and middle decades of the twentieth century. According to figures from sources cited in a Master Environmental Assessment prepared for the City by Michael Brandman in 1993, population grew from 15,252 in 1920 to 83,249 in 1960. After 1960, population grew more slowly to 88,289 in 1970 and a peak of 88,314 in 1980, before declining to 86,905 in 1990.

While population peaked and declined in recent decades, housing units continued to increase. Between 1970 and 1990, housing units grew by 14% even though population decreased by nearly 2%. The contrast between housing growth and population decline was related to an apparent reduction in household size from 2.14 persons per unit in 1970 to 1.88 in 1990. Most of the housing growth which occurred during these two decades took place between 1970 and 1980.

An examination of Santa Monica's overall land use pattern reveals that it remains a predominantly residential community. A land use survey conducted in May 1991 indicated that of a total of 3,964 acres surveyed, not including land in use as streets, residential land use comprised 2,359 acres or nearly 60%. Of this residential pattern, over 58% was in single family use, including attached as well as detached units. Commercial land uses and parking made up approximately 12% of this total area and industrial uses comprised 4%. The remainder of the City was comprised of various other land uses such as public and quasi-public lands, including beaches and parks and the Santa Monica airport. Vacant land comprised only 39 acres, or only 1% of total land use.

Notwithstanding the continuation of the single-family residential land use pattern, three-quarters of the City's dwelling units are now in multi-family structures. By 1990, 75% of the total housing stock of 47,553 units were multi-family units in structures of two or more units, whereas only 23% were single family, including attached as well as detached units. Approximately 2% were mobile homes.

Population is projected to reverse its previous downward trend. Between 1990 and 2010, population is projected to increase by 12,880, or 644 persons per year to a total of 99,785. As with employment, it is projected to maintain its 1990 share of total County population, in this case 1%, in the year 2010.

1.4 DEVELOPMENT PATTERNS AND RISK ASSESSMENT

Overall, the preceding trends and projections suggest that Santa Monica in the remainder of the two decades between 1990 and 2010 will continue to grow in population and employment at a modest pace while changing little physically. A substantial share of development activity will take place in neighborhoods planned and zoned for commercial, industrial and multi-family uses. Except for some major private redevelopment projects which may occur from time to time, most

development will probably take place on a relatively small scale through lot-by-lot replacement of older residential and commercial facilities.

Presently, low density residential development dominates the northwestern and southeastern portions of the City, as well as the areas north of Wilshire and near the airport, which is located in the easternmost corner, while commercial and industrial facilities occupy the central east-west corridor. Much of the coastline is occupied by medium and high density residential and commercial structures. Several high rise buildings are present along Ocean Avenue as part of a north-south pattern of commercial development paralleling the coast from downtown Santa Monica to the southerly City limits.

With the expected growth pattern and environmental setting, safety and planning issues center on hazard mitigation which can be effectively deployed in connection with upgrading existing development and encouraging safe development practices with the relatively small developments which will comprise the vast bulk of the new construction. Therefore, safety planning issues should be framed particularly in terms which have meaning for strengthening such small redevelopment projects as well as retrofitting of existing hazardous buildings.

Table 1.1 is a matrix checklist of safety hazards and an assessment of the risk these hazards pose on the public, based on their potential for occurrence and their potential impact. A summary of general code compliance and hazard management alternatives is also presented.

The primary mechanisms available for government to implement goals and policies toward hazard management include code compliance and special development regulations.

Code Compliance. Technical expertise in reviewing and enforcing the Building Code and Fire Code for the City of Santa Monica is provided by the Building and Safety Division and the Fire Prevention Bureau of the Fire Department. The codes establish site-specific investigation requirements, construction standards, and inspection procedures to ensure that development does not pose a threat to the health, safety and welfare of the public. The City's Municipal Code, adapted from the Uniform Building and Fire Codes, also contains base line minimum standards to guard against unsafe development. As discussed in the technical background report, investigation findings and other project variables may modify the implementation of a particular standard.

Additional guidelines and standards can be introduced through the City's Safety Element and Municipal Codes. Zoning ordinances and subdivision regulations also support regulatory codes, and safety is protected as the City carries out its responsibilities under the California Environmental Quality Act (CEQA). CEQA requires that environmental constraints be considered prior to approval of significant projects. Table 1.1 identifies the relevant code applicable to each hazard. At a minimum, it is imperative that the City continue to encourage and support strict enforcement of the regulatory codes for new development and significant redevelopment.

Special Development Regulations. Special development regulations reinforce and augment existing code standards by raising the level of hazard conscious project design and hazard mitigation engineering. Special development regulations include additional geologic/geotechnical investigation and construction standards. Foundation investigations are required in the City's Municipal Code, however, it is in the City's best interest to emphasize the level of investigation and protection. Some standards may apply only to critical facilities, such as detailed seismic analyses in high risk areas. Special construction standards may include additional reinforcement of foundations in areas of potential ground failure. Avoidance of the hazard may be appropriate in some cases where engineering methods cannot mitigate the hazards, such as is the case where ground rupture along active or potentially active fault traces are identified during project investigation. Special minimum setbacks away from active faults can be defined for structures, lifelines, or critical facilities planned on or traversing the project site. In the case of critical facilities, setbacks from potentially active faults are required under state law.

Table 1.1: MULTI-HAZARD SAFETY ACTIONS

HAZARDS		RISK			SCOPE OF RISK	CODE COMPLIANCE AND HAZARD MANAGEMENT			
		Low	Moderate	High		Building	Fire	Special Development	*Hazard Reduction
EARTHQUAKE DAMAGE	Strong Ground Motion			X	Citywide/Regional	X	X	X	X
	Fault Rupture		X		Local/Citywide			X	X
	Liquefaction	X			Local			X	
	Settlement/Subsidence	X	X		Local	X			
	Landslide	X	X		Local	X		X	X
	Dam/Reservoir Inundation	X			Local			X	
	Building Damage		X	X	Citywide/Regional	X	X	X	X
	Infrastructure/Utilities Damage		X		Local/Citywide	X	X	X	X
SLOPE AND FOUNDATION STABILITY	Deep-Seated Landslide	X			Local	X			X
	Soil Slumps		X	X	Local	X			X
	Settlement/Subsidence	X	X		Local	X			X
INUNDATION	Tsunami	X			Local			X	
	Dam/Reservoir Inundation	X			Local				X
	Shoreline Erosion	X	X		Local				X
FIRE	Industrial Fire		X		Local	X	X	X	X
	Residential Fire		X		Local	X	X		X
	Urban Brushland Interface		X		Local/Multi-Jurisdictional	X	X		X
HAZARDOUS MATERIALS	Accident within City		X		Citywide		X		X
	Accident adjacent to City		X		Citywide/Regional				X

Scope of Risk

Local - Hazard impacts localized or site-specific portion of City

Local/Citywide - Hazard impacts a significant portion or all of City

Citywide/Regional - Hazard affects large multi-jurisdictional area

*: Hazard reduction programs in-place through code-compliance and/or existing (1975) Safety Element

Hazard Reduction. Hazard reduction programs are designed to improve the safety of existing development. For example, some older structures, having been built to now-outmoded code standards, could benefit from seismic upgrading. Owners of older residences or commercial structures may voluntarily upgrade, or if a commercial facility is undergoing significant reconstruction, newer safety standards can be incorporated. Many of these issues as they pertain to unreinforced masonry structures were addressed in the City's mandatory retrofitting ordinance adopted in 1992. Additional examples of hazard reduction programs include:

- Strengthening of pipelines and development of emergency back-up capability by public utilities serving the City.
- Regular fire safety inspections and fire flow tests to identify areas with cracked or damaged water lines.
- Encouraging the construction of auxiliary water systems to supplement existing water lines. This will help ensure that adequate water flow for fire suppression will be available regardless whether the main water lines are damaged. Gravity-fed or generator-operated pumps from swimming pools, or tanks can also supplement flow.
- Planning for emergency response at the government and individual level to reduce the risk to the public from these hazards.
- Identification of unsafe structures.

1.5 SEISMIC HAZARDS

A magnitude M_w 6.7 earthquake occurred on January 17, 1994 with an epicenter located approximately 24 km (15 miles) north of Santa Monica in the Northridge/Reseda area. Substantial damage resulted from the earthquake, particularly in the northern portions of the City in the area of the east-west trending Santa Monica fault. As more information about the earthquake becomes available and further analysis is done, the City should evaluate the data and make determinations about amending or adding to policies to this section of the document.

Many of the faults traversing the southern California area have the potential of generating strong ground motions in the City of Santa Monica. The San Andreas fault is thought to have the highest probability of generating a large earthquake in the near future, however, the Newport-Inglewood fault is assumed to be the probable worst-case earthquake scenario for Santa Monica, likely posing the greatest threat to public safety and economic welfare, because this fault is capable of generating stronger ground motions in the City than the more distant San Andreas fault.

A maximum credible earthquake of magnitude 6.8 on the north branch of the Newport-Inglewood fault will produce near-field, high-frequency strong ground motions throughout the City lasting about half a minute. Peak horizontal ground accelerations of about 0.35g are expected in Santa Monica from this event, with Modified Mercalli intensity values ranging from VII to X.

Although less likely to happen, a maximum credible earthquake of magnitude 6.7 on the Santa Monica fault would result in extensive damage to buildings and infrastructure as a result of strong near-field ground motions, liquefaction, and possibly, surface rupture.

1.5.1 Goals and Policies

Goal 1: **Minimize the economic impact of strong ground motion, liquefaction and fault rupture on public and private property, and protect the public from earthquake hazards.**

Policy 1.1: The City shall promote strengthening of planned utilities (when feasible), the retrofit and rehabilitation of existing potentially hazardous structures and lifeline utilities, and the relocation of certain Critical Facilities to increase public safety and minimize potential damage from seismic and geologic hazards.

1.1.1 The City shall continue to require the retrofit of unreinforced masonry buildings through the implementation of the Ordinance that requires mandatory upgrading of this type of structure.

1.1.2 The City should continue to encourage the structural and non-structural assessment and mitigation of other types of potentially hazardous buildings, including soft/weak-story structures, pre-1952 residential structures, pre-1971 tilt-up concrete buildings and steel-frame buildings. Potential implementation measures should include:

- o Conducting an inventory and structural assessment of potentially hazardous buildings based on screening methods such as those developed by the Federal Emergency Management Agency or State Seismic Safety Commission;
- o The use of variances, tax rebates or credits, or public recognition as incentives; and
- o Development of a mandatory upgrading program for high occupancy, essential, dependent or high risk facilities.

1.1.3 The City should support State and Federal legislation requiring that pre-1972 hospital buildings and structures be upgraded to comply to current building and fire code standards.

1.1.4 The City shall identify and mitigate nonstructural and structural hazards in all City owned buildings, especially critical facilities to ensure the safety of its employees and the survival of the structure. The City should consider:

- Providing a nonstructural hazard mitigation public education system to reach all employees, businesses and the non-English speaking community.
- Adopting an ordinance requiring correction of nonstructural hazards in commercial and industrial facilities.
- Enforcing this ordinance through the City's established inspection process conducted by the various departments.

1.1.5 The City should consider participation in the Metropolitan Water District Member Agency Response System (MARS) to ensure effective communications and to receive or provide water system mutual aid during an emergency.

1.1.6 Where legally feasible, the City should coordinate with the Public Utilities Commission (PUC) and oil companies, to strengthen, relocate or take other appropriate measures to safeguard natural gas and crude oil pipelines that extend through areas of high liquefaction potential, where they cross active or potentially active faults, or where they traverse landslides or areas that may settle differentially during an earthquake.

1.1.7 The City should coordinate and support efforts by the California Department of Transportation to promote the expeditious strengthening of single-column bridges and

other potentially hazardous freeway structures that do not meet seismic safety standards, or that are seated on potentially liquefiable materials. These freeway structures include the McClure Tunnel and the I-10 overcrossings at Main Street, Fourth Street, Lincoln Boulevard, Eleventh Street, Fourteenth Street, Seventeenth Street, Twentieth Street and Cloverfield Boulevard. The City should also consider evaluating the seismic safety of the County-designated disaster routes extending through Santa Monica, and the City-designated emergency evacuation routes, to identify those sections of these corridors that may be unpassable immediately following an earthquake, and to identify secondary evacuation routes to be used by emergency relief vehicles.

Policy 1.2: The City shall strengthen the project permit and review process to ensure that proper actions are taken to mitigate the impact of seismic hazards, to encourage structural and nonstructural seismic design and construction practices that minimize earthquake damage in critical facilities, and to prevent the total collapse of any structure designed for human occupancy.

1.2.1 The City shall adequately review and enforce seismic design provisions and to identify and prevent structural and nonstructural design flaws in projects involving dependent, essential, high-risk, high-occupancy, or major commercial projects requiring City approval. This provision should include training programs for plan checkers and building inspectors, or the retention of a State-certified structural engineer.

1.2.2 The City should coordinate with building owners, architects and structural engineers early in the review process to identify unacceptable nonstructural irregularities such as overhangs or parapets.

1.2.3 Through the environmental review process, the City shall encourage special development standards, designs, and construction practices reduce seismic risks to acceptable levels for projects involving critical facilities, large scale residential developments, and major commercial or industrial developments.

1.2.4 In sites determined to be susceptible to liquefaction, the City shall require the implementation of mitigation measures designed to reduce the potential of ground failure as a result of liquefaction; these measures shall apply to critical facilities, utilities, and high-occupancy projects as a condition of project approval.

1.2.5 Planned lifeline utilities should be designed, located, structurally upgraded, fit with safety shut-off valves, and designed for easy maintenance as a condition of project approval if areas of liquefaction, unstable slopes, or active or potentially active faults cannot be avoided. The implementation of this policy shall be consistent with the City's requirements for the undergrounding of utility lines.

Policy 1.3: The City shall require geological and geotechnical investigations in areas of potential seismic or geologic hazards as part of the environmental and developmental review process.

1.3.1 The City should consider establishing Hazard Management Zones that identify areas susceptible to faulting, liquefaction, settlement and slope instability. These zones shall be established based on the current information supplied in the Technical Background Report, and updated as new data are made available. Residents, tenants and owners of property located within these Hazard Management Zones shall be notified by the City once these zones have been established or amended through the use of new data.

1.3.2 The City should support further study on the Santa Monica fault system to further define its location and recurrence interval, and provide public access to current information. The studies shall include, but not be limited to:

- Devising an acceptable and economic exploratory technique for fault location in an urbanized environment.
- Further definition of fault splay locations to refine the limits of the Hazard Management Zone for the Santa Monica fault.
- Assessing the recurrence interval of the Santa Monica fault through studies dating the occurrence of past earthquake events.

1.3.3 For projects in any designated Hazard Management Zone, the City should consider developing a threshold, based on a definition of significant development, for ground rupture hazard investigations. This evaluation shall ensure that an acceptable level of effort for exploration is undertaken, and that acceptable mitigation measures, are provided for in the design.

1.3.4 Should the Santa Monica fault be confirmed in the future as active, as a result of geologic investigations, and the State designates the fault an Alquist-Priolo Special Study Zone (APSSZ), the City shall comply with all the provisions of the Alquist-Priolo Act.

1.3.5 For properties located in liquefaction areas, the City shall require a State-certified geotechnical engineer to investigate the potential for liquefaction in alluvial and beach areas as a condition of project approval. This includes the following minimum subsurface investigation standards:

- Not less than 30 feet below the surface for structures larger than 2-story residences; or
- Not less than 50 feet below the surface for projects involving critical facilities.

1.3.6 The City shall enforce provisions for seismic analyses contained in the City-adopted Uniform Building Code (UBC) for Seismic Zone 4, including requirements for site amplification studies and dynamic analyses for critical facilities proposed in alluvial and beach areas.

1.3.7 Unique geotechnical and engineering geological consultant recommendations shall be peer reviewed by an in-house or retained geotechnical engineer and/or engineering geologist, State-registered in the corresponding discipline.

Policy 1.4: The City shall encourage alternative project designs or low intensity land uses during the environmental and developmental review process in areas determined to have significant seismic or geologic constraints.

1.4.1 The City shall require appropriate setbacks, and prohibit, if feasible, the construction of high-occupancy (greater than 100 occupants), dependent, high-risk, or essential facilities located within established Hazard Management Zones, unless the project can be mitigated to a tolerable level of risk to the satisfaction of the Building Officer.

Policy 1.5: The City shall improve the reduction of risks from seismic and/or geologic hazards during property transfers, including encouraging structural strengthening and site maintenance to reduce the risk to tolerable levels.

1.5.1 The City should consider improving the visibility of hazard declaration statements on subdivision tract, parcel and zoning maps that includes the most current data on the location and state-of-activity of the Santa Monica fault ; and

1.5.2 The City should make available pamphlets, brochures and in-house expertise to educate homeowners on earthquake preparedness, including the identification of nonstructural hazards.

1.5.3 The City should consider the preparation of City-specific hazard education tapes for broadcast over the local cable network, and establish educational "walking tours" to illustrate the greatest hazard issues affecting Santa Monica.

1.5.4 The City should provide "hands-on" training as a community resource for emergency preparation and response, that includes involving members of the community in practice drills.

1.6 GEOLOGIC HAZARDS

The geologic hazards of greatest concern to Santa Monica include coastal slope instability and erosion, subsidence potentially related to ground water withdrawal, and differential settlement related to uncertified fills. Large coastal bluff failures in the region of Palisades Park have

occurred. Clay mining operations since the early 1900's in the central portion of the City resulted in excavations which were backfilled with uncompacted fills, and in some cases utilized as landfills, which may result in differential settlement, as well as hazardous waste and explosive gas hazards. Santa Monica currently receives approximately 50 percent of its water from ground water sources beneath the City. Subsidence, as well as salt water intrusion has occurred along coastal areas to the south of the City, however, no subsidence or salt water intrusion has been reported within the City to date.

1.6.1 Goals and Policies

Goal 2: **Protect public safety and minimize the social and economic impacts of geologic hazards on the private and public sector, as those hazards pertain to unstable slopes in the Palisades Park region, and differential settlement.**

Policy 2.1: The City shall continue to use the environmental and development review process to ensure prudent development and redevelopment within areas with high landslide potential.

2.1.1 The City shall, when determined to be necessary through provisions of the California Environmental Quality Act:

- Require preliminary geotechnical and geologic investigations in areas with high landslide potential;
- Evaluate site stability, including site response to seismic events, and possible impact on adjacent properties, before final project design is approved; and
- Require that consultant reports, investigations, and design recommendations required for grading permits, building permits, and subdivision applications be prepared by a State-geotechnical engineer and State-certified engineering geologist.

2.1.2 The City shall, when determined to be necessary through provisions of the California Environmental Quality Act:

- Continue to enforce provisions of Chapters 70 and 29 in the Uniform Building Code adopted by the City of Santa Monica and support coordination between the project civil engineer, engineering geologist, and geotechnical engineer during grading and construction operations; and
- Require certification regarding the stability of a building site with respect to the adverse effects of rain, earthquakes, and differential settlement before issuance of building permits.

Policy 2.2: The City should support mitigation of existing public and private property located on unstable hillside areas, especially slopes with recurring failures, where City property or public right-of-way is threatened from slope instability, or where considered appropriate and urgent by the City Engineer, Fire, or Police departments.

2.2.1 The City should consider forming assessment districts or geologic hazard abatement districts to encourage cost-effective measures to mitigate existing seismic, landslide, erosion, or subsidence hazards. These districts should be defined based on the hazard zones indicated within the Technical Background Report, and be updated as new data warrants. Such approaches should include provisions for:

- Slope reconstruction, debris protection, slope maintenance and improved drainage and slope cover; and
- Permanent mitigation of earthquake or rain-induced slope instability problems that can block accessways beneath the bluffs in times of emergency or fire response activities.

2.2.2 The City should identify and encourage mitigation during permit review of onsite and offsite slope instability, debris flow, and erosion of lots undergoing substantial improvements.

Policy 2.3: The City should develop a geologic disaster recovery plan following severe winter storms that cause extensive landsliding or erosion.

2.3.1 The City shall require geotechnical site investigations before permitting reuse or rebuilding of a failed area, adjacent unstable slopes, or debris flow path; and establish standards for improved setbacks, surface/subsurface drainage improvements, construction of buttresses or other retaining structures, or slope reconstruction, that will minimize future risk to persons and property or public liability.

1.7 INUNDATION HAZARDS

The reservoirs that impact the City includes: the Stone Canyon Reservoir, which is owned and managed by the Los Angeles Department of Water and Power; and the Riviera Reservoir which is owned by the City of Santa Monica. In addition, the City owns three 5-million gallon reservoirs; Arcadia, Mount Olivette and San Vicente reservoirs, which may pose localized inundation hazards due to seiching during an earthquake. The low lying coastal areas within the City are susceptible to tsunami inundation in the event of a large distant earthquake, or an earthquake or undersea landslide within the Santa Monica Bay. Run-up studies for distant earthquakes are available for the City, however, tsunami run-up potential in response to local offshore earthquakes or undersea landslides has not been assessed in detail. The Safety Element must also assess the impact of 100- and 500-year flooding; however, due to the extensive storm drain network within the City, the flood hazard is classified as nil by the National Flood Insurance Program. Although the storm drain system is expected to prevent surface flooding during a storm, shoreline and nearshore structures have historically been impacted by storm generated waves.

1.7.1 Goals and Policies

Goal 3: **Minimize injury and loss of life, damage to public and private facilities and infrastructure, potential for hazardous materials accidents, and utilize urban planning to reduce social impacts from dam and tsunami inundation and storm generated waves.**

Policy 3.1: The City shall apply a minimum level of acceptable risk during the project review phase for new construction and proposals for substantial improvements to residential and nonresidential development in dam or tsunami inundation areas; and disapprove projects that cannot mitigate the hazard to the satisfaction of the Building and Safety Division or other responsible agency.

3.1.1 The City should consider the following guidelines for mitigation of potential inundation hazards:

- The ground floor of any development proposed for human occupancy within any area determined to be a inundation hazard during the project review process should be constructed one foot above the projected inundation depth. Critical Facilities should be constructed above grade to the satisfaction of the Building and Safety Division, based on Federal, State, or other reliable hydrologic studies.

- Critical Facilities should not be permitted unless the project design ensures that there are two routes for emergency egress and regress, and minimizes the potential for debris or flooding to block emergency routes.

- Facilities using, storing, or otherwise involved with substantial quantities of onsite hazardous materials shall not be permitted, unless all standards for elevation, anchoring, and inundation proofing have been satisfied; and hazardous materials are stored in watertight containers.

- Specific flood proofing measures should include permanent sealing of grade level openings; use of paints, membranes, or mortar to reduce water seepage through walls; installation of water tight doors, bulkheads, shutters; installation of flood water pumps in structures; and proper modification and protection of all electrical equipment, circuits, and appliances so that the risk of electrocution or fire is eliminated.

3.1.2 The City should discourage development of critical facilities that are proposed in dam inundation areas and apply hazardous materials safety guidelines within such zones.

Policy 3.2: The City shall continue to upgrade assessment of dam, tsunami and shoreline inundation risk and protection in the City, including coordination with the Los Angeles County Department of Public Works.

3.2.1 The basis for potential upgrading street storm drains should be related to the topography and the ability to drain stormwater, depth of inundation, relative risk to public health and safety, the potential for hinderance of emergency access and regress, and the threat of contamination of the storm drain system with sewage effluent.

3.2.2 The City should encourage periodic reevaluation of dam inundation paths, which may effect the City, by State, Federal, County, and other sources and use such studies to improve existing protection, to review protection standards proposed for new development and redevelopment, and to update the MHFP.

3.2.3 The City should encourage periodic review of predicted tsunami run-up modeling, and continually update the MHFP, as technological advances in prediction and warning progress.

3.2.4 The City should continue to develop long range planning goals in conjunction with other responsible agencies for prevention and mitigation of shoreline erosion and storm generated wave damage.

1.8 FIRE HAZARDS

In general, fire hazards are related to the characteristic type and layout of a City's development. In Santa Monica, urban fire hazards pose a considerably greater impact than brush fire hazards. The vast majority

of the City has been developed, and is devoted to structures ranging from wood-frame residential to high-rise commercial. In addition, an industrial corridor is located in the central portion of the City. Data from the Fire Department for 1991-92 and 1992-93 fiscal years indicate that of fires involving structures, nearly all were attributed to residential and commercial buildings. However, the potential for fires in industrial districts highlight the threat of hazardous materials incidences.

1.8.1 Goals and Policies

Goal 4: **Reduce threats to public safety and minimize property damage from urban fire hazards commensurate with the risk of post-earthquake fire and fires driven by Santa Ana winds.**

Policy 4.1: The City shall develop and enforce construction and design standards that ensure that proposed development incorporates fire prevention features by strengthening performance review and code enforcement programs.

4.1.1: All new development shall meet minimum standards for fire safety, unless more conservative standards are defined in the City's Municipal Code. This includes:

- Adequate road widths to accommodate emergency vehicles; and developments;
- Enforcement of Municipal Code provisions requiring automatic fire extinguishing systems and other fire safety standards.

4.1.2 The City shall enforce the standards and guidelines of the Uniform Building Code and Uniform Fire Code fire safety provisions and require additional standards for high-risk, high occupancy, dependent, and essential facilities where appropriate. This shall include assurance that structural and nonstructural architectural elements of the building are designed not to:

- Impede emergency egress for fire safety manpower, equipment, and apparatus; and
- Hinder evacuation from fire, including potential blockage of stairways or fire doors.

4.1.3 The City shall continue to enforce fire safety in high-rise buildings, including provisions for automatic sprinkler systems and emergency utility systems.

Policy 4.2: The City shall reduce existing developments to tolerable levels of risk and strengthen the City fire fighting capability to respond to multiple fire incidents caused by an earthquake, Santa Ana winds, or other extraordinary circumstances.

4.2.1 The City shall support an aggressive code enforcement program in areas where the potential exists for multiple fire incidents, accelerated fire growth, or other unacceptable risks are identified in residential areas or in individual dependent, essential, or high occupancy facilities. The City should consider:

- Mandatory replacement of existing roofing materials with Class A construction for all buildings; and
- Mandatory mitigation of potential hazards posed by faulty electrical circuits.

4.2.2 The City shall provide public information and support private efforts to restrain, immobilize, or reduce hazards of gas-fired appliances in residential buildings and encourage automatic natural gas shutoff earthquake sensors in high occupancy industrial and commercial facilities.

4.2.3 The City shall enforce existing provisions of the Municipal Code that require installation of sprinkler systems in any existing building found to provide inadequate access for fire fighting equipment or apparatus. In addition, emergency standby electrical power for fire warning systems and emergency water pumps should also be required.

Policy 4.3: Conduct and implement long-range fire safety planning to cope with increasing urban density caused by new development, redevelopment, and property infilling, including development of stringent Building or Fire Municipal Code standards, improved infrastructure, and improved mutual aid agreements with the private and public sector.

4.3.1 The City shall continue the coordination between the City Engineer and Fire Department to improve fire fighting infrastructure through the replacement and/or relocation of old cast-iron pipelines and inadequate water mains when street improvements are planned.

4.3.2 The City shall continue to develop a program to utilize, where feasible, existing water wells in the City for emergency fire suppression water sources and efforts to utilize private sector water storage facilities. The City should consider participation in the Metropolitan Water District Member Agency Response System (MARS) to ensure effective communications and to receive or provide water system mutual aid during an emergency.

4.3.3 The City shall strengthen interjurisdictional fire response agreements, and improve fire fighting resources to keep pace with construction of additional high-rises, mid-rise business parks, increasing numbers of facilities housing immobile populations, and the risk posed by multiple ignitions to help ensure that:

- Fire reporting and response times do not exceed the current average response time of five minutes;
- Fire flow engine and hydrant requirements are consistent with Insurance Service Office (ISO) recommendations; and
- The height of truck ladders and other equipment and apparatus are sufficient.

4.3.4 It has been documented that fire damage is reduced by 90 % in buildings that are fully sprinklered, and that there have been no documented fire deaths in such buildings. To ensure a fire-safe community and to protect the citizens and property, the City shall consider adoption of a sprinkler ordinance requiring all new construction or buildings undergoing substantial remodelling to be fully sprinklered.

4.3.5 It has been proven that lives have been spared solely due to the installation and maintenance of smoke detectors in residential dwellings. Smoke detectors have the capability of altering occupants of a fire, allowing them to evacuate the building.

Current ordinance requires detectors to be installed when there are four or more units, or when a property is remodeled or sold. The City shall consider adopting an ordinance requiring that all residential dwellings install smoke detectors per current code.

1.9 HAZARDOUS MATERIALS

Currently over 600 businesses use, store, or manufacture hazardous materials or extremely hazardous materials in some amount within the City. Nine businesses within the City currently use, store, or manufacture extremely hazardous materials, including ammonia, sulfuric acid, ethylene oxide, and sodium cyanide. The Fire Department has identified about 25 businesses that pose a significant risk to the community due to the volume or type of hazardous material used, stored, or manufactured. Pre-fire plans have been developed for each of these 25 businesses, and are maintained on each Fire Department apparatus in the Fire Department Communication Center. The City has also targeted businesses outside of the City limits that may potentially effect the City in the event of a hazardous materail release. The Santa Monica Water Treatment Plant, located east of the City, stores and uses large quantities of chlorine. An industrial corridor between Olympic and Pico Boulevards has also been targeted by the City Fire Department as a possible problem area.

1.9.1 Goals and Policies

Goal 5: **Minimize threats to public health and safety from hazardous materials by strengthening local code enforcement actions, especially the potential for multiple releases caused by earthquakes.**

Policy 5.1: The use, storage, and transportation of toxic, explosive, and other hazardous and extremely hazardous materials shall be strictly controlled to prevent unauthorized discharges.

5.1.1 The City shall continue to strengthen enforcement of the Uniform Fire Code, including provisions for:

- Secondary containment;
- segregation of chemicals to reduce reactivity during a release;
- sprinkler and alarm systems; and
- monitoring, venting, and automatic shutoff systems.

5.1.2 The City shall continue to manage the Hazardous Materials Disclosure Program (HMDP) to identify and regulate businesses handling types and quantities of extremely hazardous materials, or hazardous materials in greater than consumer types and quantities.

5.1.3 The City shall continue to require annual reporting by businesses to the Environmental Programs Division of the use, storage or manufacture of hazardous or extremely hazardous materials in any quantity. The City shall continue to require annual submission or verification of business emergency plans by businesses that use, store or manufacture any hazardous or extremely hazardous materials in quantities equal to or

greater than 55 gallons, 500 pounds or 200 cubic feet. Annual fire inspections of commercial and industrial properties should include:

- Confirming the accuracy of information provided in the business plans;
- identifying businesses that have not complied with HMDP requirements; and
- identifying businesses that are not in compliance with regulations governing storage, use and/or manufacturing of hazardous or extremely hazardous materials.

5.1.4 The City shall encourage proper in-house management of extremely hazardous or hazardous materials including:

- Minimum onsite storage of hazardous materials;
- proper segregation and storage of hazardous or extremely hazardous materials;
- substitution of less-hazardous, or non-hazardous substances; and
- proper disposal of hazardous wastes on a regular basis.

5.1.5 The City should consider amending the Municipal Code, defining permitted onsite quantities, uses, and storage requirements in each of the City's commercial and industrial zones to address risk to adjacent residential areas, immobile populations, and constraints posed by seismic, geologic, or inundation hazards, including provisions for:

- Supplemental regulations regarding handling, storage, containment, and transportation of hazardous and extremely hazardous materials, and emergency notification and communication system requirements;
- special or conditional use permits for earthquake-resistant design of structural and nonstructural components; and
- strengthening potentially hazardous structures which house hazardous materials.

5.1.6 The City should improve local hazardous materials response capability, including:

- Development of a specialized hazardous materials response unit that is equipped for identification and containment of unauthorized releases of hazardous materials; and
- development of specific criteria and procedures for decontamination and evacuation of on-site and nearby populations.

Policy 5.2: Coordinate regional objectives for hazardous materials management with adjacent jurisdictions.

5.2.1 The City should review the Los Angeles County Hazardous Waste Management Plan in relation to coordinating regional information regarding the location of existing facilities that store hazardous materials and supplying and receiving information from adjacent cities.

5.2.2 The City shall continue to coordinate with the State Office of Emergency Services, State Highway Patrol, City and County of Los Angeles Fire Department, and Los Angeles County Waste Control (Health HazMat) in the development of regional plans for transportation routes and hazardous materials response mutual aid.

1.10 DISASTER PREPAREDNESS

The City of Santa Monica Draft Multi-Hazard Functional Plan (MHFP), dated June 1989, is currently in working draft form. The MHFP establishes the responsibilities of the various City agencies in times of a disaster. Disaster preparedness and response planning includes identifying short-term actions that can reduce the scope of an emergency, and managing and planning the necessary resources in the event of a disaster. After any disaster, and an earthquake in particular, short-term disaster recovery requires operations that are not as immediate as fire suppression or medical attention but are equally important to protecting public safety.

1.10.1 Goals and Policies

Goal 6: **Maintain short and long-range plans to protect public health, safety and economic welfare from disasters caused by earthquakes, landslides, inundation, fire, hazardous materials accidents, and other natural or man-made hazards.**

Policy 6.1: The City shall stringently enforce code regulations, adopt or modify ordinances and take other actions as needed to prepare and response effectively to emergencies.

6.1.1 The City shall continually strengthen the MHFP and maintain mutual aid agreements with Federal, State, local agencies and the private sector to assist in:

- Clearance of debris in the event of widespread slope failures, collapsed buildings or structures, or other circumstances that could result in blocking emergency access or regress;
- heavy search and rescue and fire suppression;
- lifeline utility restoration;
- hazardous materials response;
- temporary shelter;
- traffic and crowd control; and
- building inspection.

6.1.2 The City should identify and utilize multilingual staff personnel to assist in evacuation and short-term recovery activities and provide vital evacuation and relocation information on "flash-cards" to be read by non-multilingual emergency personnel.

6.1.3 The City should consider requiring commercial businesses, utilities, and industrial facilities that handle hazardous materials to:

- Install automatic fire and hazardous materials detection, reporting and shut-off devices; and

- install an alternative warning communication system in the event power is out or telephone service is saturated following an earthquake.

6.1.4 The City should provide on-going disaster preparedness and hazard awareness training to all City employees, businesses and the community. The community training may be accomplished in cooperation with the City's Neighborhood Support Center and could be based upon a Neighborhood Watch model. The City should consider:

- Maintaining a fire control plan, including an onsite fire fighting capability and volunteer fire response teams to respond to and extinguish small fires;

- identification of medical personnel, or local residents, capable and certified in first aid and CPR;

- the amount of staff and resources required to provide this level of service in a timely and sustained manner; and

- businesses paying a small fee per employee trained to cover the cost of materials for this level of service.

6.1.5 The City shall continue to conduct joint regional earthquake drills with Los Angeles County and, where appropriate:

- Utilize information regarding potentially hazardous areas or buildings to develop internal scenarios for emergency response; and

- test back-up power generators in public facilities and other critical facilities taking part in the earthquake drill.

6.1.6 The City should improve management and emergency dissemination of information using a computer geographic information system or other appropriate means, such as:

- Portable computers with access to information in Hazardous Materials Disclosure Program Business Plans regarding the location and type of hazardous materials;

- information on seismic, geologic, or flood hazards; and

- information on the location of high occupancy, immobile populations, and potentially hazardous building structures, or utilities.

6.1.7 The City should evaluate and provide additional emergency power generation capabilities at all City owned critical facilities. The amount of electrical power generated should keep the facility functional and have reserve fuel supplies to last at least 72 hours.

6.1.8 The City should evaluate and provide enough emergency supplies to accomplish assigned duties and sustain its employees for at least 72 hours. The City should budget and maintain an adequate:

- Emergency food, water and sanitation capability;
- emergency medical supplies capability;
- emergency lighting capability; and
- vehicle emergency refuelling capability.

6.1.9 The City should maintain a climate controlled bulk storage facility to extend the shelf life emergency supplies purchased in large quantities.

6.1.10 The City shall establish an organized emergency management system and location for conducting and coordinating post-disaster rescue, recovery and reconstruction activities. The emergency management system and location for conducting these activities should be continuously evaluated and modified as needed to accomplish this function in the most effective and efficient manner possible. The City should consider:

- Establishing the Emergency Operation Center (EOC) and alternate site in a facility and dedicated location that has a high probability to survive in a disaster, allows for continuous set-up of needed supplies and equipment, contains emergency power generation and adequate communication capability with City Departments, City hospitals and health care facilities, and the community.
- Establish a post-disaster emergency communications network with City hospitals and health care facilities.
- The Emergency Operations Center (EOC) and alternate site size and layout should provide adequate work space for the number of personnel anticipated to conduct emergency mitigation activities.
- Developing an emergency management system which establishes pre-identified EOC staffing positions based on the type of emergency situation affecting the City and provides flexibility for pre-designated partial or complete activation of those EOC positions.
- Providing continuous emergency management training for all City Officials, Department Heads, supervisors, employees and key personnel from business, industry and the community on their roles and responsibilities before, during and after a disaster.

Policy 6.2: The City should regularly review and clarify emergency evacuation plans for dam failure, flood inundation, fire and hazardous materials releases, civil unrest and aircraft disasters.

6.2.1 The City should develop a blueprint for managing evacuation plans, including allocation of buses, designating and protecting disaster routes, traffic control contingencies, and other actions.

6.2.2 The City should encourage communication and cooperation between the City's emergency response organization and appropriate staff at hospitals, high occupancy buildings, and dependent care facilities during County-wide earthquake drills.

6.2.3 The City should adopt inundation alert and readiness levels corresponding with official forecasts by the State Office of Emergency Services and Los Angeles County Sheriff regarding: Earthquake prediction; tsunami inundation; and potential for dam failure.

Policy 6.3: The City should develop plans for short-term and long-term post-disaster recovery.

6.3.1 The City should consider adopting a pre-disaster ordinance for post-disaster recovery and reconstruction.

6.3.2 The City should include in that ordinance authorization for implementation of extraordinary recovery measures, activated by the declaration of local emergency, including debris clearance and storage, damage and hazards assessment, demolitions, reoccupancy and moratorium criteria, fee waivers and deferrals and expedited repair permitting procedures, including temporary suspension of Zoning Code provisions regarding nonconforming uses and buildings.

SAFETY ELEMENT

POLICY IMPLEMENTATION SCHEDULE

(Timeframes for Policy Initiation)

HAZARD	POLICY NUMBER	ON-GOING	1 YEAR	3 YEARS	5 YEARS	10 YEARS
SEISMIC HAZARDS						
Retrofit and rehabilitation	1.1.1	xxx				
	1.1.2	xxx				
	1.1.3	xxx				
	1.1.4	xxx				
	1.1.5		xxx			
	1.1.6	xxx				
	1.1.7	xxx				
Project permit review	1.2.1	xxx				
	1.2.2	xxx				
	1.2.3	xxx				
	1.2.4	xxx				
	1.2.5	xxx				
Geological/	1.3.1			xxx		
Geotechnical investigations	1.3.2	xxx				
	1.3.3				xxx	
	1.3.4	xxx				
	1.3.5				xxx	
	1.3.6	xxx				
	1.3.7	xxx				
Project design and land use	1.4.1	xxx				

HAZARD	POLICY NUMBER	ON-GOING	1 YEAR	3 YEARS	5 YEARS	10 YEARS
Public education	1.5.1	xxx				
	1.5.2		xxx			
	1.5.3		xxx			
	1.5.4		xxx			
GEOLOGIC HAZARDS						
Environmental/Development	2.1.1		xxx			
Review within landslide areas	2.1.2	xxx				
Mitigation of risk to existing	2.2.1			xxx		
property within landslide areas	2.2.2			xxx		
Geotechnical site investigations	2.3.1		xxx			
INUNDATION HAZARDS						
Mitigation of inundation hazards	3.1.1		xxx			
	3.1.2		xxx			
Assessment of inundation risks	3.2.1			xxx		
	3.2.2	xxx				
	3.2.3			xxx		
	3.2.4	xxx				

HAZARD	POLICY NUMBER	ON-GOING	1 YEAR	3 YEARS	5 YEARS	10 YEARS
FIRE HAZARDS						
Standards for fire prevention	4.1.1	xxx				
	4.1.2	xxx				
	4.1.3	xxx				
Mitigation of fire hazards	4.2.1			xxx		
	4.2.2		xxx			
	4.2.3	xxx				
Long range fire safety planning	4.3.1	xxx				
	4.3.2	xxx				
	4.3.3	xxx				
	4.3.4			xxx		
	4.3.5			xxx		
HAZARDOUS MATERIALS						
Hazardous materials controls	5.1.1	xxx				
	5.1.2	xxx				
	5.1.3	xxx				
	5.1.4	xxx				
	5.1.5			xxx		
	5.1.6		xxx			
Regional cooperation for	5.2.1		xxx			
hazardous materials management	5.2.2	xxx				

HAZARD	POLICY NUMBER	ON-GOING	1 YEAR	3 YEARS	5 YEARS	10 YEARS
DISASTER PREPAREDNESS						
Regulations, ordinances and	6.1.1	xxx				
procedures	6.1.2		xxx			
	6.1.3		xxx			
	6.1.4	xxx				
	6.1.5	xxx				
	6.1.6	xxx				
	6.1.7			xxx		
	6.1.8		xxx			
	6.1.9			xxx		
	6.1.10	xxx				
Emergency evacuation plans	6.2.1		xxx			
	6.2.2		xxx			
	6.2.3		xxx			
Post-disaster recovery	6.3.1	xxx				
	6.3.2	xxx				