City of Inglewood

Multi-Hazard Mitigation Plan

March 23, 2010

Prepared by:
I.T. Crisis Services, Inc. (ITC)

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RESOLUTION NO. 09-78

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF INGLEWOOD, CALIFORNIA ADOPTING THE CITY OF INGLEWOOD HAZARD MITIGATION PLAN

WHEREAS, the City of Inglewood having gathered information and prepared the City of Inglewood Hazard Mitigation Plan to reduce or eliminate the effects of hazards to the residents and community; and

WHEREAS, the Plan has been prepared in compliance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Local Advisory Task Force comprised of representatives from city departments, public service agencies within Los Angeles County, and local for-profit and non-profit organizations provided oversight of the plan development process; and

WHEREAS, the Local Advisory Task Force has sought broad public participation and the City Council of the City of Inglewood conducted a final public hearing on Tuesday, August 18, 2009, affording community members an opportunity to comment and provide input regarding the Plan and the actions defined within; and

WHEREAS, the City Council of the City of Inglewood has reviewed the Plan and affirms that City will seek to implement the Plan, subject to available funding, and maintain the Plan as required by relevant state and federal authorities.

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NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Inglewood does hereby adopt this Hazard Mitigation Plan as approved by FEMA and as may be necessarily amended.

BE IT FURTHER RESOLVED that the FEMA approved Hazard Mitigation Plan is adopted into the safety element of the City's General Plan in compliance with AB 2140.

PASSED, APPROVED, and ADOPTED this 18th day of August, 2009.

Mayor of the City of Inglewood

Attest:

City Clerk

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STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) SS.
CITY OF INGLEWOOD)

I, YVONNE HORTON, City Clerk of the City of Inglewood, California do hereby certify that the whole number of members of the CITY COUNCIL of said city is five; that the foregoing resolution, being Resolution No. 09-78 is the full, true and correct original of Resolution No. 09-78 of the said City of Inglewood, California entitled:

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF INGLEWOOD, CALIFORNIA, ADOPTING THE CITY OF INGLEWOOD HAZARD MITIGATION PLAN.

which was duly passed and adopted by the said City Council, approved and signed by the Mayor of said city, and attested by the City Clerk of said City, all at a regular meeting of said Council held on the 18th day of August, 2009, and that the same was so passed and adopted by the following vote:

Ayes: Council Members Morales, Tabor, Franklin, Dunlap and Mayor Dorn;

Noes: None;

Absent: None;

Not Voting: None.

I do hereby further certify that pursuant to the provisions of Section 6, of Article X, of the City Charter of said City, the said foregoing Resolution No. 09-78 and regularly published according to the California Crusader, a newspaper of general circulation, printed, published and circulated within the said City, and that the same was so published therein on the following date, to wit: August 18, 2009.

WITNESS my hand and the seal of said City the 18th day of August, 2009.

(SEAL)

City Clerk of the City of Inglewood

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Executive Summary

Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to people and property from natural and man-made hazard events. The City of Inglewood developed this Local Hazard Mitigation Plan (LHMP) to make the City's infrastructure and residents less vulnerable to future hazard events. This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 so that the City of Inglewood would be eligible for the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation and Hazard Mitigation Grant programs.

The City followed a planning process prescribed by FEMA, which began with the formation of a Local Planning Team (LPT) comprised of key City agency representatives. The LPT engaged a consultant, I.T. Crisis Services, Inc. (ITC), to develop this plan and created a Local Advisory Task Force (LATF) comprised of representatives of City and Los Angeles County agencies and representatives of local profit and non-profit organizations to provide oversight over the plan development.

A risk assessment was conducted to identify and profile natural and man-made hazards that pose a risk to the City of Inglewood, assess the City's vulnerability to these hazards, and examine the capabilities in place to mitigate them. The City is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Earthquakes, hazmat releases, and human threat events/terrorism are among the hazards that are considered to be high risk and subsequently can have a significant impact on the City.

Based on the risk assessment, goals and objectives for reducing the City's vulnerability to hazards were identified. The four goals of this multi-hazard mitigation plan are:

- Minimize loss of life and property from natural and man-made hazard events
- Protect public health and safety
- Increase public awareness of risk from natural and man-made hazards
- Enhance emergency services including warning systems

To meet identified goals and objectives, the plan recommends 44 mitigation measures, which are summarized in the table that follows. In addition to the mitigation measures, the table includes the lead agencies to carry out the measures, potential sources of funding, the timeline in which the measures will be addressed, and the priority of the measures. This plan has been formally adopted by the City and a schedule has been adopted to review and update the plan annually.

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
All Hazards				
1.1.1 - Reactivate the Disaster Council	Information Systems	General Fund	Short-term	**Critical**
1.1.2 - Continue the Advisory Task Force as a Council Board	Information Systems	General Fund	Short-term	**Critical**
1.1.3 - Create a position for a full-time, fully funded Emergency Preparedness Coordinator in Public Safety Systems Section of IT&C	Information Systems	General Fund	Short-term	**Critical**
1.1.4 - Initiate and maintain comprehensive training programs for city personnel for ICS, etc, for both safety and non-safety personnel	Information Systems	General Fund Federal/State Grants	Short-term	**Critical**
1.1.5 - Create a functional Emergency Operations Center	Information Systems	General Fund Federal Grants (HMGP/PDM)	Short-term	**Critical**
2.1.1 – Conduct an evaluation of the existing warning system in City Hall to determine its efficacy in reaching all people within the building in the event of a hazmat release or potential terrorism event	Information Systems	General Fund Federal Grants	Short-term	**Critical**
2.2.1 – Assess evacuation plans for City Hall to consider the conditions under which evacuation will take place or when the building will be secured with everyone remaining inside	Information Systems	General Fund Federal Grants	Short-term	**High**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
2.2.2 - Evaluate Buffer Zone or Evacuation Plans for public facilities and critical facilities (i.e. Water Treatment Plant)	Public Works	General Fund Federal Grants	Short-term	**High**
2.3.1 - Develop and sustain a reliable mass notification system	Information Systems	General Fund Federal Grants	Short-term	**Moderate**
3.1.1 – Create a website that includes detailed information and links to existing preparedness and mitigation resources addressing earthquake, hazmat release, and terrorism risks	Information Systems	General Fund	Short-term Ongoing	**High**
3.1.2 – Provide information in both English and Spanish	Information Systems	General Fund	Short-term Ongoing	**High**
3.2.1 – Develop a program to create and distribute written materials to educate the public about hazard risks facing the City	Information Systems	General Fund	Long-term Ongoing	**Moderate**
3.2.2 - Sponsor an annual Emergency Preparedness Fair	Information Systems	General Fund	Long-term Ongoing	**Moderate**
4.1.1 – Retain the Advisory Task Force as a permanent City fixture	Information Systems	General Fund	Short-term Ongoing	**Moderate**
4.1.2 – Enhance relationships with the local Chamber of Commerce, Partners for Progress, and local health clinics	Information Systems	General Fund	Short-term Ongoing	**Moderate**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
Earthquake				
5.1.1 – Develop a relocation plan or find an alternative facility for the Emergency Operations Center (EOC)	Information Systems	General Fund Federal Grants (HMGP/PDM)	Short-term	**Critical**
5.1.2 – Develop a relocation plan or find an alternative facility for the City's data center	Information Systems	General Fund Federal Grants	Short-term	**Critical**
5.1.3 – Conduct a study to find a location outside the City to establish a back-up to the City computer system	Information Systems	General Fund Federal Grants	Short-term	**Critical**
5.1.4 – Complete the program to remove the outdated computer aided dispatch (CAD) system from an obsolete main frame computer	Information Systems	General Fund	Short-term Ongoing	**Critical**
6.1.1 - Ensure all new development and redevelopment is sited and constructed in accordance with the General Plan and zoning ordinances.	Building and Planning	General Fund	Long-term Ongoing	**High**
6.1.2 - Adopt, upon approval by the International Code Council (ICC) and the State of California, revisions to the California Building Code which increase seismic resistance of structures to ground shaking and other geologic hazards.	Building and Planning	General Fund	Long-term Ongoing	**High**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
7.1.1 – Conduct a geotechnical study to determine if the City Hall lies on the Newport-Inglewood fault	Public Works	General Fund Federal Grants (HMGP/PDM)	Short-term	**Critical**
7.1.2 – Conduct a risk assessment of the City's water treatment plant and City reservoirs	Public Works	General Fund Federal/State Grants	Short-term	**Critical**
7.1.3 – Identify and acquire an acceptable site for the relocation of the Police Building out of the Newport-Inglewood fault zone	Police	General Fund HMGP/PDM	Short-term	**Critical**
7.1.4 – Establish a non-structural hazard evaluation and risk reduction program for city buildings and departments housing critical functions	Public Works	General Fund HMGP/PDM	Long-term	**Critical**
7.1.5 - Install seismic bracing on all critical IT equipment and back-up power sources.	Public Works	General Fund	Short-term	**High**
7.1.6 - Install seismic bracing bars on main branch library shelves to prevent collapse and public injury	Public Works	General Fund HMGP/PDM	Short-term	**High**
8.1.1 - Establish a methodology for developing a soft story building inventory	Building and Planning	General Fund	Long-term	**Under Study**
8.1.2 – Inventory privately owned soft story buildings in the City	Building and Planning	General Fund	Long-term	**Under Study**
8.1.3 – Inventory privately-owned tilt-up buildings in the City	Building and Planning	General Fund	Long-term	**Under Study**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
8.2.1 – Support efforts to seismically retrofit Centinela Hospital to meet the requirements of SB 1953 (Alfred E. Alquist Hospital Seismic Safety Act of 1983)	Information Systems	General Fund	Short-term Ongoing	**Critical**
8.2.2 - Consider developing a tilt-up retrofit code to encourage retrofit of privately-owned tilt-up buildings	Building and Planning	General Fund	Long-term	**Under Study**
8.2.3 – Conduct a risk assessment of high occupancy buildings and all buildings currently listed as potential post-disaster shelters	Building and Planning	General Fund	Long-term	**Under Study**
8.2.4 - Encourage retrofit of single family homes including bolting to foundations, strengthening cripple walls, and removing or strengthening masonry chimneys	Building and Planning	General Fund Federal/State Grants (HMGP/PDM/CEA)	Long-term	**Under Study**
9.1.1 - Join the Southern California Earthquake Center (SCEC)	Information Systems	General Fund	Short-term	**Under Study**
9.2.1 – Develop and distribute information to citizens	Information Systems	General Fund	Short-term	**Moderate**
Hazmat Releases				
10.1.1 – Educate the public about the hazardous materials to which they may be exposed and how to identify them	Information Systems LA County Fire	General Fund	Long-term	**Under Study**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
10.2.1 – Develop a list of preventive measures to protect the public	Information Systems LA County Fire	General Fund	Long-term	**Under Study**
10.2.2 – Encourage businesses that work with hazardous materials to install preventive measures that contain or limit hazmat releases	Information Systems LA County Fire	General Fund	Long-term	**Under Study**
10.2.3 – Encourage high occupancy and critical facilities to install preventive measures that re-circulate air and prevent outside air from entering the facilities	Information Systems LA County Fire	General Fund	Long-term	**Under Study**
Human Threat Events/Terrorism				
11.1.1 – Review and update city anti-terrorism plans and procedures with the Los Angeles Airport and Los Angeles City police and homeland security departments	Police	General Fund	Short-term Ongoing	**Under Study**
11.1.2 - Create an education program that mirrors the model developed by the Joint Regional Information Center (JRIC), to sensitize public safety employees and the general public to pre-incident indicators of terrorist activities	Police	General Fund	Short-term Ongoing	**Moderate**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
11.1.3 - Incorporate terrorism awareness and prevention in on-going Police training programs and day-to-day law enforcement activities	Police	General Fund	Short-term Ongoing	**Moderate**
11.1.4 - Develop a training program for line level Public Safety Employees to interdict in pre-incident indicators of terrorist activities.	Police	General Fund	Short-term Ongoing	**Moderate**

Table ES-1: Mitigation Measures - Summary

1.0 Introduction

1.1 Purpose of the Plan

This Plan analyses the risk posed to people and property in the City of Inglewood from natural and technological hazards, and presents a list of mitigation actions that the City can implement prior to such events to reduce the personal harm and property damage caused by them. This Plan represents the City's commitment to pre-disaster mitigation, prevention and preparation. It helps fulfill the City's regulatory obligations as established by law and serves as a guide for decision makers as they commit resources to reduce the impacts of such hazards. It also serves as the basis for the State and/or Federal government to provide technical and financial assistance for mitigation programs and projects.

Hazard Mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to human life and property. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, it can protect critical community facilities, reduce exposure to liability, and minimize community disruption. In the past, emergency management has focused primarily on responding after the fact to disasters. Recent changes in Federal policy resulting from escalating disaster costs and passage of the Disaster Mitigation Act of 2000 (DMA 2000) have given new impetus to hazard mitigation planning. Under the DMA 2000, the City of Inglewood is required to have a FEMA-approved Local Hazard Mitigation Plan to be eligible for certain pre- and post-disaster mitigation funds.

This document fulfills FEMA requirements and provides direction and guidance on implementing hazard mitigation in the City of Inglewood. Adoption of the Plan by the City Council and approval by FEMA qualifies the City of Inglewood to obtain federal assistance for hazard mitigation. Recent legislation signed into law by Governor Schwarzenegger recognizes the importance of Local Hazard Mitigation Plans (LHMP), by providing additional state disaster assistance funding to those jurisdictions that append an approved LHMP to the Safety Element of their General Plan.

The primary purpose of this plan is to identify community policies, actions and tools for implementation over the long-term that will result in a reduction in risk and potential for future losses community wide. This is accomplished by using a systematic process of learning about the hazards that can affect the City, setting clear goals, identifying and implementing appropriate actions, and keeping the plan current. This plan is an integral part of the City's multi-pronged approach to minimizing personal injury and property damage from natural and technological disasters, and it complements other planning documents and regulatory authorities governing pre-disaster land use planning and post-disaster response and recovery. It also acknowledges the numerous financial, regulatory and compliance issues government faces on a daily basis. It is intended to set the tone for the implementation of hazard mitigation practices that will build a disaster resistant and sustainable community.

1.2 Community Profile

1.2.1 Physical Setting

The City of Inglewood, one of eighty-eight incorporated cities is located within southwestern Los Angeles County. Generally, Inglewood is bordered to the north by the unincorporated Los Angeles County communities of Ladera Heights, Baldwin Hills, View Park and Windsor Hills as well as the City of Los Angeles, to the south by the City of Hawthorne and the unincorporated Los Angeles County community of Lennox, to the east by the City of Los Angeles, and to the west by the Los Angeles International Airport (LAX), the City of El Segundo and unincorporated portions of Los Angeles County.[1] The location of the City of Inglewood within the Los Angeles Basin is shown in Figure 1-1 below.

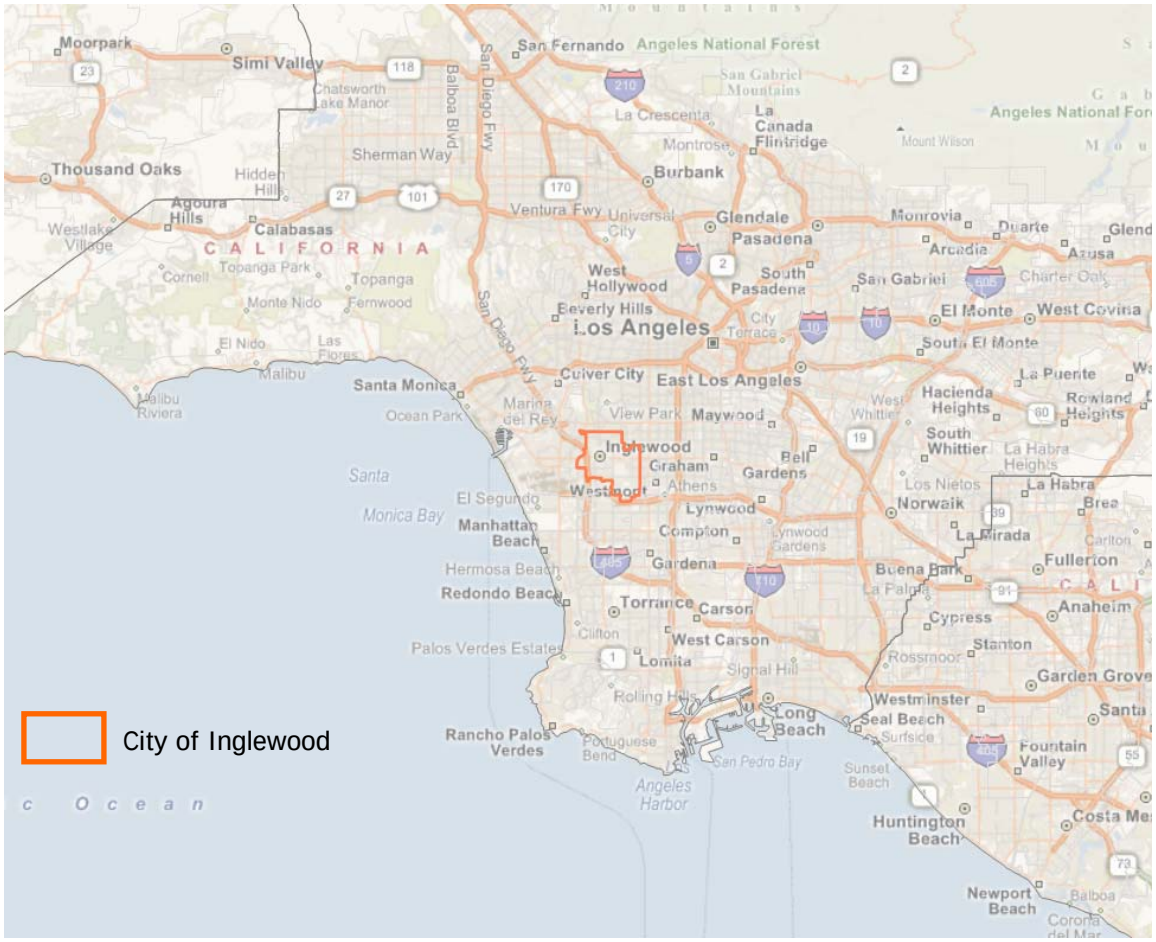

Figure 1-1: Regional Setting (Credit: Microsoft Virtual Earth)

Situated within the Inglewood-Torrance coastal plain at the northern end of the Centinela Valley, the City encompasses approximately 8.9 square miles of land area. The majority of the City on average, is about 100 feet above sea level, with the highest points on the northeastern perimeter rising to about 250 feet above sea level.

During the Miocene and Pliocene periods (5 to 25 million years ago), the Los Angeles Basin and the surrounding mountains were submerged beneath the Pacific Ocean. However, movement and collision of tectonic plates during the Pleistocene (2 million years ago) elevated much of this area above sea level. This seismic activity eventually created the landforms that exist today. Due to intense north/south compression, the Transverse Range in this region is one of the most rapidly rising areas on earth.

The City is underlain by a thick (10,000 to 12,000 feet) section of Tertiary and Quaternary marine and continental sedimentary rocks deposited on an igneous-metamorphic basement complex within the Los Angeles sedimentary basin. The Tertiary rocks, consisting primarily of sandstone, siltstone, and shale, are almost entirely of marine origin and range in age from Eocene and Pliocene. The Quaternary rocks consist of shallow marine sandstone and siltstone and continental siltstone, mudstone, and gravels.[2]

The City of Inglewood is located within the boundaries of three watersheds: Los Angeles, Ballona, and Dominguez. The Dominguez Watershed makes up the greatest portion of the City and covers approximately 3,900 acres or approximately 67 percent. The Ballona Watershed makes up 1,936 acres (33 percent) and the Los Angeles Watershed covers only one acre (0.02 percent) of the City. The City of Inglewood drainage system drains into the various tributaries of each watershed discussed above. Typically, these areas are predominately channelized and highly developed with both commercial and residential properties. Most of the drainage networks are controlled by structural flood control measures, including debris basins, storm drains, underground culverts, and open concrete channels.[3]

Inglewood enjoys a moderate climate with seasonal high temperatures averaging in the upper 70's and seasonal lows in the upper 40's. On average, the coolest month is December and the warmest month is August. The highest recorded temperature was 110 degrees, which occurred in September 1963. The lowest recorded temperature was 27 degrees in January 1949. The rainy season generally begins in November and ends in April, with the maximum average precipitation occurring in February. Monthly average precipitation totals during the rainy season range from one to three inches per month.[4]

1.2.2 History

Inglewood, like most Southern California communities began as an agricultural and ranching community and within a century transformed into an urban industrial community. Inglewood's roots lie in the Rancho Aguaje del Centinela, a 2,200-acre property named after the Centinela Spring around which it was located. The

headquarters of the ranch property, called the Centinela Adobe House, is considered to be the birthplace of Inglewood. The Centinela Adobe was completed in 1834 by Ignacio Machado, who owned it briefly. The property passed through many hands before finally being purchased in 1885 by Daniel Freeman, a Canadian attorney who had arrived in the area in 1873. By 1887, Freeman had become a partner in the Centinela-Inglewood Land Company. The stated purpose of this land company was to create a town near Centinela Springs.

The Inglewood City plan was divided into northern and southern sections by the California Central Railroad and it was completed in 1887. By 1888 Inglewood had a population of three hundred, a school with an enrollment of thirty-three students, several small businesses, including five real estate offices, a hotel and a railway station.

On February 14, 1908, Inglewood was incorporated as a city. The population had grown to 1,200. By then a Poultry Colony and the Inglewood Park Cemetery had been added along with a streetcar line.

Growth was slow and steady, with the 1920 census reporting a population of 3,248. A combination of events spurred growth in the 1920's and 1930's. Two earthquakes, the first on June 21, 1920 and the Long Beach earthquake in 1933 are both attributed as catalysts for development. Although the 1920 event caused only localized damage in Inglewood, local lore states that people flocked to the City to look at the damage, found the area to their liking and stayed permanently. This is borne out by the increase in population to 7,000, as reported in 1922 census figures. The widespread regional damage caused by the Long Beach earthquake also stimulated growth as southern California residents and businesses sought relocation. The advent of the automobile began to decentralize the residential development in Inglewood and by the end of the 1930's, Inglewood's economic base began to expand outside the core downtown area.

The Hollywood Park racing facility opened in 1938, making Inglewood the home of Southern California's racing season and made Inglewood a tourist destination. Perhaps of greater significance to Inglewood's future development was its proximity to Mines Field, an airstrip located to the southwest of the city. Mines Field, purchased by the City of Los Angeles in 1937, and renamed as Los Angeles Airport in 1946, directly affected Inglewood's development. Airplane manufacturers and related businesses located their factories in the area, and by the time of America's entry into the World War II, Los Angeles had become the nation's center for aircraft industry.

These developments directly affected Inglewood's growth. In 1938, the City had a population of 26,000; by 1956, the community had grown to 63,000. The downtown area began to lose its primacy as the city's shopping center. By the early 1960s, the city included four retail business areas, which, in addition to downtown, included North Inglewood, Morningside Park, and Crenshaw. The influx of defense-related industries, in addition to expanding retail areas, transformed the agriculturally oriented town into an urban industrial community, which ultimately brought Inglewood its present "urban look".

1.2.3 Demographics

According to the 2000 Federal Census of Population and Housing, the City of Inglewood had an estimated population of 112,580. The City also has a population density of 12,800 people per square mile. U.S. Census data provided in 2007 indicates an increase in population to 113,376.

The historical growth of the City is attributed primarily to annexations of developed tracts through the 1960 and 1970's. Demographic shifts since then have resulted in an increase in family size and ethnic diversity. Currently the predominant race/ethnic characteristic of the population consist of 46% Black and 46% Latino. 32% of the population is within the extremely low to low-income HUD defined income categories.[5] 80% of the housing stock is older than 30 years. The total number of households in the City is over 36,000 with the tenancy of the housing stock being roughly 40% owner occupied and 60% rental occupancy. Of the total population, according to the 2000 Census, 7% are elderly. Nearly 17% of all households have a resident over the age of 65; and approximately 38% of these households or 6% of the total number or 2,300 households have an elderly person living alone. Over 12,000 persons in the City are considered handicapped or disabled with a quarter of these residents being elderly.[6]

The City's population is projected to increase to 126,000 in 2010 according to the Southern California Association of Governments (SCAG) based on a presumed growth rate of 4.5%.[7]

1.2.4 Existing Land Use

The City of Inglewood contains approximately 8.9 gross square miles of land area. A land use map is included as Figure 1-2 on the following page.

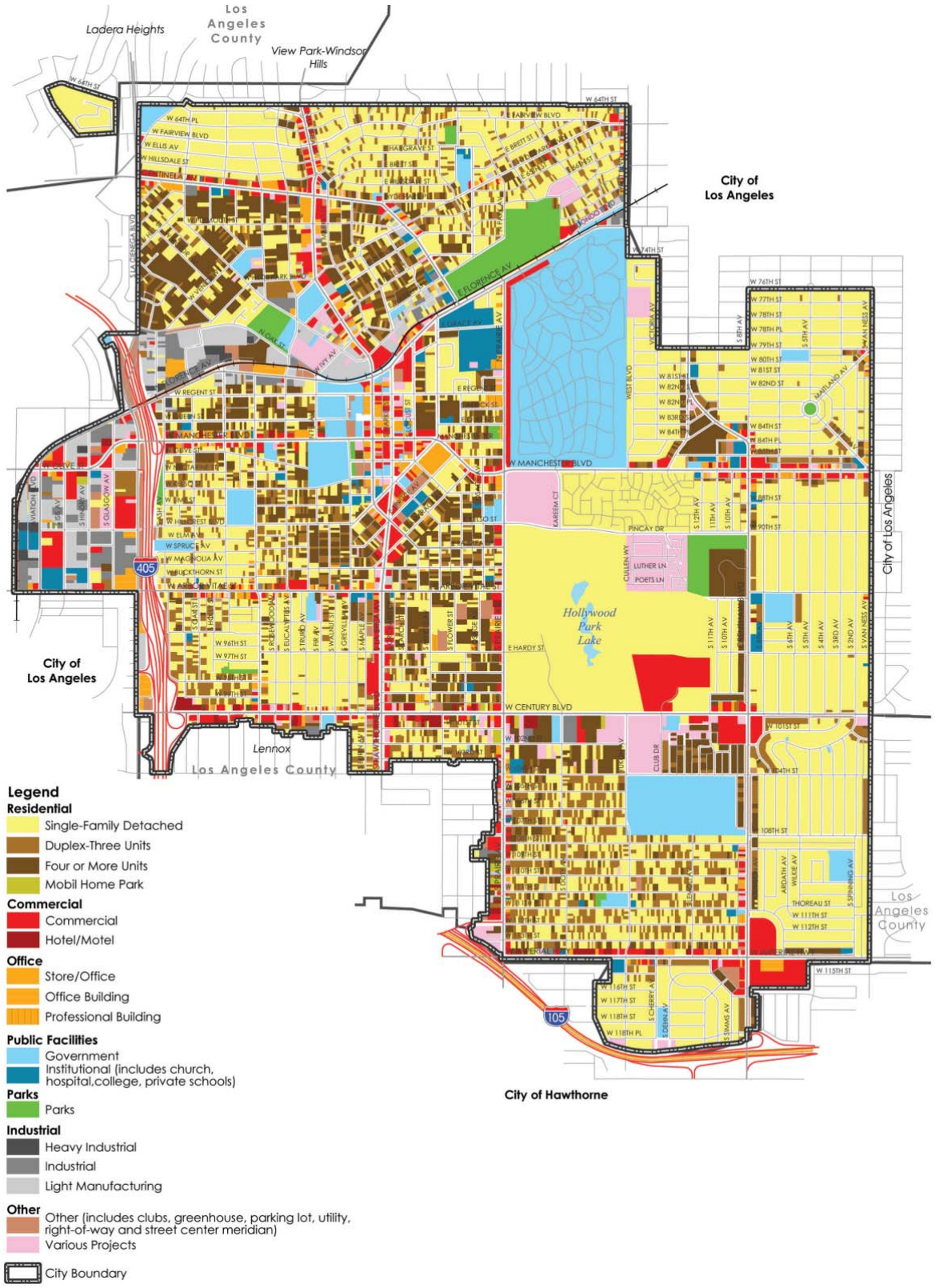

Figure 1-2: Existing Land Use (Source: City of Inglewood General Plan)

The following discussion pertains to the existing land uses in the City, as shown in Table 1-1 below. The land use data in this figure is based on data obtained by the City from the Los Angeles County Assessor's office. Existing land uses fall under five general categories as follows.[8]

Residential—Residential uses within the City include primarily single- and multifamily development. Other residential uses include mobile homes, elderly homes, and boarding houses.

Commercial—Includes uses that offer goods for retail sale to the public such as department stores, shopping centers, and supermarkets; and service uses such as restaurants, service stations, and beauty salons. Commercial land uses include businesses that serve local needs, such as restaurants, neighborhood markets and dry cleaners, and those that serve community or regional needs, such as auto dealers, furniture stores, hotels and motels.

Office—Includes professional and administrative office uses.

Industrial—Includes low- and high-intensity industrial and manufacturing uses (e.g. industrial, heavy industrial, light manufacturing, storage, warehouse, etc.).

Public Facilities—Includes civic and governmental buildings and institutional uses such as City Hall, the Courthouse, police and fire stations, libraries, churches, schools, hospitals, etc.

Other—Includes land uses which do not fall into one of the specific categories listed above. These uses include utilities, right-of-ways, parking lots, greenhouses, etc.

Land Use	Acres	Percent of City
Residential	3022.8	66.4
Commercial	296.9	6.5
Office	113.4	2.5
Industrial	191.7	4.2
Public Facilities	562.5	12.4
Parks	92.6	2.0
Other	253.9	5.6
Total	***4551.6***	***100.0***

Table 1-1: Existing Land Use

1.2.5 Development Trends

The City of Inglewood is a mature built-out city, with few opportunities for new development. Most new development will occur as a result of infill or redevelopment.

The Inglewood Redevelopment Agency was established in 1969 to revitalize blighted areas in the City that have been designated as Redevelopment Project Areas by the City Council. The overall goal of the Agency is to eliminate blight to promote new development and to enhance private sector investment within the Project Areas. The City currently has six Redevelopment Project Areas: In-Town, La Cienega, North Inglewood Industrial, Manchester-Prairie, Century, and Imperial Prairie.[9]

All future development/redevelopment projects will be constructed to current design standards and building codes, and are not expected to contribute to community vulnerability from natural or technological hazards.

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[1] City of Inglewood General Plan Update Technical Background Report (Section 1.3)

[2] City of Inglewood General Plan Update Technical Background Report (Section 6.1-1, 6.1-2)

[3] City of Inglewood General Plan Update Technical Background Report (Section 5.2-1)

[4] http://www.weather.com/weather/wxclimatology/monthly/graph/90301?locid=90301

[5] City of Inglewood Consolidated Plan 2001-2004

[6] Ibid

[7] South Bay Cities Infrastructure and Services Capacity Assessment, South Bay Cities Council of Governments, 2003

[8] City of Inglewood General Plan Update Technical Background Report (Section 2.1-1)

[9] City of Inglewood General Plan Update Technical Background Report (Section 2.1-24)

2.0 The Planning Process

The planning process began when the City Council supported the City Administrator's Office request to apply for Pre-Disaster Mitigation Grant (PDM) funds from the Federal Emergency Management Agency (FEMA) to develop a Local Multi-Hazard Mitigation Plan for the City of Inglewood. The planning grant was awarded to the City by FEMA in 2007.

This Mitigation Plan is the product of a rational thought process that reviewed the hazards, estimated their risks to the community, identified alternative mitigation measures, and selected those that will work best for the City.

The City of Inglewood followed an eight-step planning process, based on the requirements outlined in the Disaster Mitigation Act of 2000 and written guidance published by FEMA and the California Emergency Management Agency (CalEMA) (formerly the California Office of Emergency Services). Resource documents accessed include the FEMA "How-to-Guides", the "Local Hazard Mitigation Planning Guidance" issued by FEMA in July 2008, and the "Local Hazard Mitigation Plan Crosswalk". The eight steps are described below. Additional documentation of the planning process can be found in the Project Quarterly Progress Reports, which are included in Appendix A.

2.1 Step One: Organize to Prepare the Plan
(April 2008 – May 2009)

The City Administrative Officer in conjunction with the Office of the Chief of Police designated the Police Department as the lead agency for the mitigation planning effort. Leadership, management and oversight for the plan development process was provided through the City established Local Planning Team. Team members were selected based on current emergency management responsibilities and familiarity with prior mitigation planning and programs. To supplement staff resources and secure the services of subject matter experts, the City issued a Request for Proposals (RFP) and retained a consultant team to work with the City to provide plan development and management assistance.

2.1.1 Local Planning Team

The Local Planning Team (LPT) met monthly, or more frequently as necessary, with the Consultant Team at City Hall or by conference call throughout the planning process to provide guidance, review progress, identify issues, and make arrangements for all Local Advisory Task Force and citizen stakeholder meetings. The LPT also provided background documents, facilitated data collection, reviewed all draft documents, and collaborated with the consultant team on all planning process decisions. The Local Planning Team (LPT) consists of five City employees. The members are:

- Martin Sissac, Captain, City of Inglewood Police Department, Project Manager
- Micah Herd, Grants Coordinator, City of Inglewood Police Department, Assistant Project Manager

- Michael Calzada, Residential Sound Insulation Program Director
- Michael Falkow, Deputy City Administrator/Chief Information Officer (CIO)
- James Madia, Lieutenant, City of Inglewood Police Department

2.1.2 Consultant Team

The contract for consulting services was awarded to I.T. Crisis Services, Inc. (ITC), based upon the extensive background and experience of the proposed team and their approach to completing the required tasks. The Consultant Team was responsible for facilitating the planning process, including all LPT and Advisory Task Force (LATF) meetings, acquiring all necessary data, performing the risk assessment, preparing draft mitigation goals, objectives, and strategies, conducting the review process, and producing all draft and final documents for submission to the California Office of Emergency Management (CalEMA) and the Federal Emergency Management Agency (FEMA). The ITC team assembled for this project includes:

- Elliott Mittler, Project Manager - responsible for overall project management and coordination and plan development
- Paula Schulz, Planner, Natural Hazards Mitigation - responsible for plan development and state and federal compliance
- Charles Huyck, Executive Vice President, & Shubharoop Ghosh, Vice President, ImageCat - responsible for hazard identification, vulnerability analysis, and loss estimation

2.1.3 Local Advisory Task Force

Oversight of the planning process was provided by a Local Advisory Task Force (LATF), which includes representatives of every City department that has a role in hazards protection, representatives of the County of Los Angeles Fire and Public Health Departments, and representatives of important for-profit and non-profit organizations in the City of Inglewood.

The LAFT met quarterly during the planning process to provide input, guidance, and critical feedback to the Local Planning Team and Consultant Team. The LATF played a critical role in identifying existing programs, plans, studies and data to support the planning effort, in identifying and prioritizing hazards to be addressed in the plan, in developing the overall goals and objectives and suggesting and prioritizing draft mitigation strategies for future implementation. A hazard mitigation planning survey was distributed to LATF members and other critical city departments to gather information about their hazard related concerns, on-going programs, and suggestions for future action. A copy of the survey and a summary of key results are included as Appendix B.

The Local Advisory Task Force consists of:

- Craig Bragg, Inspection Supervisor, Building Safety Department, City of Inglewood
- Gary D. Burden, Battalion Chief, Los Angeles County Fire Department

- Martin Freeman, Treatment Plant Supervisor, Water Treatment Plant, City of Inglewood
- Harry Frisby, Public Works Superintendent, Public Works Department, City of Inglewood
- Jesus Guerrero, Water Treatment Plant, City of Inglewood
- Stan Horn, Director of Plant Operations, Centinela Hospital Medical Center
- Marc Little, Chief Operating Officer, Forum Enterprises and President, Partners for Progress
- Rick Longobart, Fleet Manager, Fleet Services, City of Inglewood
- John Martinez, Battalion Chief, Los Angeles County Fire Department
- Beverly Pye, Director of Pupil Personnel Services, Inglewood Unified School District
- Jacqueline Russell, Community and Disaster Services, Faithful Central Bible Church
- Carrie Wang, Bioterrorism/Disaster Preparedness Public Health Nurse, Los Angeles County Department of Public Health

2.1.4 Data and Document Review

At the outset of the planning effort, the Consultant Team prepared a comprehensive list of plans, documents, and data sets that could support plan development. The Local Planning Team and Advisory Task Force members provided readily available documentation that was incorporated as appropriate into various sections of the draft plan, specifically the Risk and Capabilities Assessments. Individual meetings with departmental representatives were held to acquire specific data sets and to access digital files maintained in the City's Geographic Information System. Additionally, the Consultant Team conducted document and web site research to access state-of-the art hazard and mitigation resources. A reference list of documents reviewed and incorporated into the planning process is included in Section 7 of this Plan.

2.2 Step Two: Coordinate with Other Agencies and Organizations
(September 2008 – July 2009)

The primary mechanism for ensuring coordination with other agencies and organizations that could support mitigation plan development and implementation was the LATF. At the outset of the planning process, the LPT identified a number of agencies, organizations, businesses and non-governmental entities to be invited to participate in the plan development effort. These included key County agencies (Public Health, Fire, Emergency Services); the largest private sector employers (Los Angeles Worldwide Airport, the Forum, the Hagen Group, Marvin Engineering); critical facilities (Water Treatment Plant, Centinela Hospital); the Inglewood Unified School District; and non-governmental and community based organizations (American Red Cross; Faithful Central Bible Church, Neighborhood Block Groups). All of the organizations were contacted via letter or telephone and invited to participate as members of the Local Advisory Task Force. Those who responded positively were included in the LAFT. Additionally, a separate contact was made with the City of Inglewood Partners for

Progress, a public-private sector initiative whose membership includes: Hollywood Park Land Company, Hollywood Park Casino, Centinela Hospital Medical Center, City of Inglewood, the Forum, Inglewood/Airport Area Chamber of Commerce, Inglewood Park Cemetery and Los Angeles World Airports. Representatives of the Local Planning Team and Consultant Team subsequently made a presentation to the group to inform them of the mitigation planning effort and to solicit their input and concerns relative to natural and man-made hazards.

2.3 Step Three: Involve the Public

(January 2009 – July 2009)

The Local Planning Team undertook a number of initiatives to inform the public of this effort and to solicit their input. The Planning Team discussed several alternatives to the public input process, including hosting a public workshop, a web-based survey, and targeted community-based stakeholder workshops. After extensive deliberations, the decision was made to hold a series of three community-based stakeholder workshops. The LPT believed this to be the mechanism that would be most successful in soliciting public input and was in keeping with the standard public input process used for similar projects in the City.

The three workshops were held at the Inglewood City Hall on February 20, February 21, and March 28, 2009. The LPT developed lists of invitees and mailed invitations to each person, then followed up with telephone calls. The first stakeholder meeting included members from the Inglewood business and professional communities. The second stakeholder meeting included citizens representing neighborhood groups and homeowner associations. The third stakeholder meeting included citizens who have been CERT trained. In all three workshops, the Consultant Team presented an overview of the local hazard mitigation planning process and a risk analysis of the natural and man-made hazards facing the City of Inglewood. The citizens then provided their input about their concerns about each hazard, what they are doing to prepare for and to mitigate high risk hazards and what activities the City should engage to prepare for, mitigate, and respond to the highest risk hazards. A list of invited participants and workshop materials are included in Appendix C.

Once completed, the draft Multi-Hazard Mitigation Plan was calendared for a Public Hearing at the August 18 City Council Meeting and posted at that time for public review on the City web page. Hard copies were available at the City Administrative Offices and the Library. The Public Hearing was held as scheduled and several members of the public offered comments. The City Council and the Local Planning Team determined how these public comments would be included in the draft plan prior to final publication. Following the public comment period, the City Council formally adopted the Multi-Hazard Mitigation Plan.

Table 2-1 below shows a list of all Local Planning Team, Local Advisory Task Force meetings, Stakeholder Workshops and their dates.

Date	Activity
July 30, 2008	Initial Local Planning Team (LPT) Kick-off meeting to overview the planning process, timelines and meeting schedules, and the roles of the LPT and the consultant
September 11, 2008	LPT meeting
October 9, 2008	LPT meeting
October 14, 2008	Partners for Progress Planning Meeting
October 15, 2008	Partners for Progress Presentation
October 30, 2008	LPT meeting
November 18, 2008	Initial Local Advisory Task Force (LATF) meeting to overview the planning process, timelines and meeting schedules, and the roles of the LATF. In addition, the LATF members were asked to review a preliminary risk evaluation and to provide the LPT with studies and other information related to mitigation activities. The mitigation planning survey was distributed at the meeting and made available electronically to all LATF members.
December 16, 2008	LPT meeting
January 9, 2008	LPT meeting
January 21, 2009	LPT meeting
February 10, 2009	LPT meeting
February 19, 2009	LATF meeting to provide a status report of the project. It included an analysis of information collected in the surveys previously distributed to ATF members and a presentation of an updated risk assessment.
February 20, 2009	First Community Stakeholder meeting composed of business and professional representatives.
February 21, 2009	Second Community Stakeholder meeting composed of neighborhood and housing representatives.
March 12, 2009	LPT meeting
March 28, 2009	Third Community Stakeholder meeting composed of Community Emergency Response Team (CERT) members.
April 16, 2009	LPT meeting
May 13, 2009	LATF meeting to discuss alternative mitigation activities the City could undertake and to collect suggestions for additional mitigation activities.
May 13, 2009	LPT meeting
July 9, 2009	LATF meeting to discuss and prioritize mitigation measures the City plans to initiate and complete in the next five years.
July 9, 2009	LPT meeting
August 18, 2009	Public Hearing and City Council Plan Adoption

Table 2-1: City of Inglewood Local Planning Team, Local Advisory Task Force Meetings, and Stakeholder Workshops

2.4 Step Four: Assess the Hazard
(September 2008 – April 2009)

In September 2008, the Consultant Team began identifying natural and man-made hazards that affect the City of Inglewood with the full cooperation of the Local Planning Team and agencies in the City of Inglewood. A comprehensive list of (13) natural and man-made hazards was considered for investigation.

Natural Hazards Considered:

Dam Failure	Earthquake
Flood/Winter Storms	Hurricane Wind/Storm Surge
Tornado	Tsunami
Wildfire	

Man-Made Hazards Considered:

Airplane Crash	Civil Unrest
Hazardous Material Release	Human Threat Events/Terrorism
Nuclear Incident	Train Derailment

These hazards were ranked as low, medium or high based upon the perceived threat to the City. The analysis of these hazards is described in Section 3 of this plan. Initial hazard ranks were developed and presented to the Local Planning Team in October 2008 and to the Local Advisory Task Force at the November 2008 LATF meeting. The ranks were adjusted based on input provided by the LPT and LATF members who reviewed the preliminary hazard assessment. A revised hazard assessment was presented at the three stakeholder meetings in February and March 2009 for citizen reactions. The LPT and LATF reached consensus on the final hazards to be included in this mitigation plan. The hazards with significant potential for damage to Inglewood are earthquake, hazardous materials release, and human threat event/terrorism.

2.5 Step Five: Set Goals
(May 2009 – August 2009)

Project and community hazard mitigation goals and objectives for the City of Inglewood were proposed by the Local Planning Team to guide the development of the plan. These were then commented on by the Local Advisory Task Force to refine the goals. At the last Local Advisory Task Force meeting, the Local Planning Team and the Local Advisory Task Force arrived at a consensus agreement.

2.6 Step Six: Review Possible Mitigation Measures
(May 2009 – August 2009)

A variety of mitigation measures that can affect hazards or the damage from hazards were examined. These mitigation activities are organized by hazard and fall within one of the following four categories (See Section 5 for a description of mitigation goals, objectives, and measures):

1. Public Information and Education – Outreach projects and technical assistance
2. Preventive Activities – Zoning, building codes
3. Structural and Property Protection Projects – Earthquake retrofit
4. Emergency Services – Warning, evacuation

2.7 Step Seven: Draft a Multi-Hazard Mitigation Plan

(April 2009 – August 2009)

Following the stakeholder meetings and the third LATF meeting, a first draft of the final plan was written. It was then reviewed by the LPT and the LATF before a second draft was prepared for public review and forwarded to the City so it might be introduced on the City Council agenda.

2.8 Step Eight: Adopt the Plan

(June 2009 – August 2009)

The Inglewood City Council formally adopted the Multi-Hazard Mitigation Plan following a Public Hearing at the August 18, 2009 City Council Meeting. Final recommended revisions were incorporated and the Plan was then submitted for courtesy review to the California Emergency Management Agency. Additional revisions were made based on recommendations by CalEMA. The plan was then formally submitted to CalEMA and the Federal Emergency Management Agency for final review and approval.

3.0 Risk Assessment

3.1 Introduction

This section discusses the risk assessment approach for the City of Inglewood's Hazard Mitigation Plan. FEMA defines the risk assessment process as a multi-step effort in "Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA 2001)." The steps include: 1) identify and screen your hazards, 2) profile hazard events, 3) inventory assets, and 4) estimate losses (see Figure 3-1). The risk assessment approach for Inglewood is composed of these four steps, and each step is organized in a separate subsection of Chapter 3. Section 3.2 (step 1) includes hazard identification and screening. During this process, all reasonably possible hazards affecting the City are considered and ranked by the City of Inglewood stakeholders and the Advisory Task Force (ATF). Section 3.3 (step 2) provides a profile for each of the significant hazards identified during the screening process. In general, the hazard profiles are addressed on a regional level. Wherever possible the profile includes a discussion of local characteristics and possible impacts on the community. Section 3.4 (step 3) discusses the process of creating an inventory of the City's assets. This step includes the comprehensive information gathering and prioritization process essential to perform the vulnerability assessment and loss estimation. Section 3.5 (step 4) presents the methodologies and results of loss estimation for the key hazards identified in step 2.

Figure 3-1: 4-step risk assessment process (FEMA 386-2, August 2001)

3.2 Hazard identification and screening

The first step in the risk assessment process is hazard identification and screening. The natural and manmade hazards considered for this plan are identified in Table 1. Information to compile this list was gathered from a combination of resources: i) FEMA 386-2, Chapter 1: Step One, Identify Hazards, ii) expert knowledge of Project Team members, iii) reports, historical records, articles and internet websites, and iv) talking to community members of Inglewood. After the list was complete, the severity of each hazard was assessed through the following screening process:

1. Natural and man-made hazards that have the potential to impact life and property in the City of Inglewood were identified. These included hazards that have occurred in the past or have a probability of occurring in the future.
2. Hazards were ranked as low, medium or high based upon the perceived threat to the city. A threat category of low designates hazards unlikely to occur. A hazard in the medium category has some likelihood of occurrence but does not pose a significant threat to the community. A designation of high is assigned to hazards when a significant threat is identified.
3. Initial hazard ranks were adjusted based on input provided by the Advisory Task Force (ATF) members (see Section 2.1.3 for ATF member list), who reviewed the preliminary hazard assessment and provided significant feedback, particularly in the area of civil unrest (downgraded) and hazardous materials (upgraded).

3.2.1 Hazard Screening Criteria

The initial threat assessment of each hazard is based upon the following sources:

1. Historic occurrence of the hazard- Assessment is based on frequency, magnitude and potential impact of the hazard.
2. Mitigation potential for the hazard- This criteria considers if there are mitigation or counter measures possible to prevent or alleviate the risk. For example, although Inglewood is located beneath the landing path of the Los Angeles International Airport (LAX) and there are significant concerns over an airplane crash, an airplane crash is not the sort of hazard for which mitigation plans have proved successful.
3. Expert opinion- Evaluation of threats includes a literature review and the expertise of the project team.
4. Published data and information- Assessment is based on data and/or information from credible publications or websites. (for example U.S. Geological Survey, California Geological Survey, National Weather Services, or academic publications)

Rankings used for the hazard screening are defined as follows:

Low- There has been no historic occurrences of the hazard in the community or region and experts feel that it is highly unlikely that the hazard will occur in the community. The citizens agree.

Medium- There may or may not have been a historic occurrence of the hazard in the community or region but experts feel that it is possible that the hazard could occur in the community. Citizens may feel that there is a likelihood of occurrence but the consequences will be negligible in terms of building damage and loss of life.

High- There may or may not have been historic occurrences of the hazard in the community or region but experts feel that it is likely that the hazard will occur in the community and the risk is significant. Citizens feel that there is a likelihood of occurrence and the consequences will be significant in terms of building damage and loss of life.

3.2.2 Hazard Assessment Matrix

The results of the screening process described above are presented as a hazard assessment matrix in Table 3.1 below. The matrix illustrates the nature and potential of threats from natural and manmade disasters to the City of Inglewood. The project team developed the preliminary matrix, which was reviewed and modified during the ATF meetings. As a part of the screening process, the project team developed a series of hazard maps from publicly available sources. (See Table 3-2 below and Appendix D for hazard screening maps and sources).

	Hazard	Historic Occurrence	Mitigation Potential	Low	Medium	High
1	Airplane Crash	Yes	No		X	
2	Civil Unrest	Yes	No		X	
3	Dam Failure	No	Yes	X		
4	Earthquake	Yes	Yes			X
5	Flood / Winter Storms	No	Yes	X		
6	Hazmat Release	No	Yes			X
7	Human Threat Events/ Terrorism	No	Yes			X
8	Hurricane Wind / Storm Surge	No	Yes	X		

	Hazard	Historic Occurrence	Mitigation Potential	Low	Medium	High
9	Nuclear Incident	No	Yes	X		
10	Tornado	No	Yes	X		
11	Train Derailment	No	No		X	
12	Tsunami	No	Yes	X		
13	Wildfire	No	Yes	X		

Table 3-1: Hazard Assessment Matrix

This section provides an explanation of the final rankings presented in the matrix and, where applicable, identifies the use of maps used during the ranking process. Table 3-2 provides lower resolution of maps provided in Appendix D, as well as data references.

1. **Airplane crash** ranked medium hazard. Although the City of Inglewood is directly under the landing path of planes arriving at (LAX), since airplane crashes are infrequent and statistically improbable at a given location the project team and the ATF ranked the threat as medium. In addition, the ATF noted there are no obvious mitigation options for the city at this time, so a detailed risk study may not be warranted. Map 1 in Appendix D provides 65-decibel noise contours used as a proxy map to delineate the hazard.

2. **Civil Unrest** ranked medium hazard. Due to the civil unrest of 1992, the project team identified this as a potential hazard. However, the community observed that the city learned valuable lessons and that the threat was not as significant as other natural and manmade hazards. The general consensus is that this hazard, if occurring, will be limited to isolated areas and will not escalate to disastrous levels.

3. **Dam Failure** ranked low or insignificant hazard. Engineering studies of dams in the area indicate that a breech in any given Los Angeles county dam is not expected to inundate Inglewood. The dam inundation map in Appendix D, *Map 2: Dam Inundation* shows the inundation zone for all dams in the county, as provided by the California Emergency Management Agency (CalEMA).

4. **Earthquake** ranked high hazard. Earthquake hazard maps and the history of large, damaging earthquakes in the Southern California region indicate high risk for the City of Inglewood. Appendix D, *Map 3: Alquist Priolo Fault Zones* shows the Alquist Priolo fault zones intersecting the city while the Newport Inglewood fault transects the City of Inglewood. *Map 4: Landslide and Liquefaction* shows the potential landslide and liquefaction zones within the area. Although landslide is not a major local hazard, it has regional impacts. Some parts of the city are within the liquefaction zone.

5. **Flood / Winter Storm** ranked low or insignificant hazard. Winter storm flooding occur in the city occasionally, but with little or no consequence to property or human life. Appendix D, *Map 5: Flood / Winter Storms* show the delineated flood zone in the region and it falls outside the city boundary.

6. **Hazardous Materials (Hazmat) Release** ranked high hazard. Hazardous materials release in areas of high seismic risk and densely populated and industrialized areas such as Inglewood is a significant threat. Given the risk of hazmat spill from train derailment accidents in the vicinity of Inglewood, major freeways transporting hazardous materials through the city as well as a high demand of such material for LAX and local businesses, the community perceived the release of hazardous material as a high threat. City of Inglewood records indicate there have been four releases reported since 2006. These were all transportation related accidents/spills. No serious consequences have been reported.

7. **Human Threat Events/ Terrorism** ranked high hazard. Due to the proximity of LAX, and several credible threats to this facility, the project team and ATF ranked this hazard as high.

8. **Hurricane Wind/Storm Surge** ranked low or insignificant hazards. Given the location of Inglewood, it is highly unlikely these hazards will affect the community.

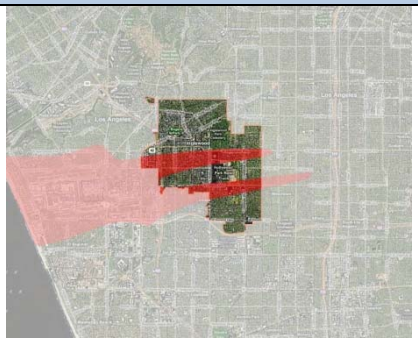
9. **Nuclear Incident** ranked low or insignificant hazard. There are no nuclear facilities located in or near the city. The closest operating nuclear power plant is San Onofre, located 80 miles south of Inglewood. The prevailing wind patterns do not put the city within the projected impact area of a potential release. As such, the likelihood of occurrence is low.

10. **Tornado** ranked low or insignificant hazard. There are no occurrences of significant damage from tornados in Los Angeles County, and it is highly unlikely a tornado will affect the community.

11. **Train Derailment** ranked medium hazard. Between 1990 and 2009, several incidents of train derailment led to damaged property and loss of lives in the Los Angeles county region (Federal Railroad Database). However, the affect of such incidents were not disastrous. As such, the community perception is that this hazard is a medium threat to the city.

12. **Tsunami** ranked low or insignificant hazard. Given the location of Inglewood, which is a significant distance from the pacific coast, it is highly unlikely a tsunami will affect the community. See Appendix D, *Map 6: Tsunami* for the tsunami inundation zone.

13. **Wildfire** ranked low or insignificant hazard. Given a concrete landscape and a lack of vegetation, wildfire is an unlikely threat to the city. Although some areas of potential wildfire hazard exist in the region, these areas do not fall within the city boundary. See Appendix D, *Map 7: Wildfire* for Wildfire zones around Inglewood.

Hazard Screening Maps	Description
	Airplane crash ranked as a medium hazard. Appendix D, Map 1: 65 Decibel Noise Contours (shown in red) *(source: Los Angeles International Airport)* used to delineate the extent of this hazard.
	Dam Failure ranked as a low/ insignificant hazard. Appendix D, Map 2: Dam Inundation shows that the inundation zone *(source: California Emergency Management Agency/CalEMA)* in case of a dam failure (shown in light blue) falls completely outside the city.
	Earthquake ranked as a high hazard. Appendix D, Map 3: Alquist Priolo Fault Zones *(source: California Geological Survey/ CGS)* shows the Alquist Priolo fault zones (shown in yellow) intersecting the city.

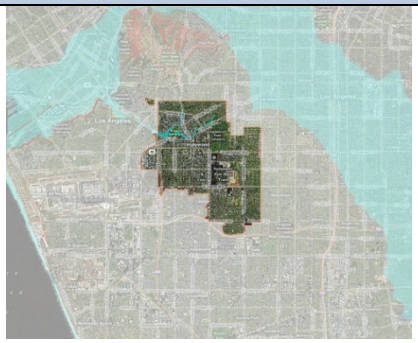
Hazard Screening Maps	Description
	Earthquake ranked as a high hazard. Appendix D, Map 4: Landslide and Liquefaction *(source: California Geological Survey/ CGS)* identifies area of concern in the area (shown in light blue).
	Flood / Winter Storm ranked as a low / insignificant hazard. Appendix D, Map 5: Flood/ Winter Storms *(source: FEMA/DHS)* show the delineated flood zone in the region (shown in light blue) and it falls outside the city boundary.
	Tsunami ranked as a low/ insignificant hazard. See Appendix D, Map 6: Tsunami for Tsunami inundation zone *(source: California Emergency Management Agency/CalEMA*) and note this is located several miles from the city boundary (shown in light blue).
	Wildfire ranked as a low/ insignificant hazard. Appendix D, Map 7: Wildfire *(source: California department of forestry and fire protection)* shows Wildfire zones (shown in red) around Inglewood.

Table 3-2: Hazard Screening Maps

3.2.3 Final Hazard Selection

As shown in Table 3-1, there are three hazards that were given a high threat rating: earthquake, hazardous materials release, and human threat event/terrorism. The following sections profile these three hazards, (Section 3.3), inventory assets in the city (Section 3.4) and estimate losses or assess risk for significant events associated with these three hazards (Section 3.5).

3.3 Hazard Profiles

Profiling the selected hazards is the second step in the risk assessment process. As discussed in Section 3.2, the project team and the ATF members reached consensus on the hazards to be included in the City of Inglewood's plan. The hazards with significant potential for damage in Inglewood are:

- Earthquake – High
- Hazmat Release – High
- Human Threat Events/ Terrorism – High

The information presented on each of the hazards in this section includes a description of their characteristics. For earthquakes, general information on the nature of the hazard is provided, with specific references to the local conditions in Inglewood. Historic occurrences and probabilistic ground shaking for the region are also presented. The extent of these events and measures are used to identify the vulnerable parts of the city and are used in the inventory development and loss estimation steps discussed in Section 3.4 and 3.5 respectively.

A general description of hazmat sources is provided, and areas of concern are highlighted. The profile includes information on local transportation routes and pipeline networks that deliver hazmat products to and from the city. Fixed site sources in Inglewood provided in a spreadsheet file by the Los Angeles County Fire Department are used as a part of the profiling process. This section also provides a review of the regulatory setting for hazmat release mitigation.

For human threat events/ terrorism, a discussion of the nature of the hazard is presented at the regional and local levels. The vulnerable sites in Inglewood and the surrounding region are identified and a qualitative risk assessment is presented in Section 3.5.

3.3.1 Earthquake

According to FEMA (2001), *"An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of Earth's tectonic plates. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and after just a few seconds can cause massive damage and extensive casualties. Common effects of earthquakes are*

ground motion and shaking, surface fault ruptures, and ground failure." This section presents the general characteristics and effects of earthquakes, including conditions specific to Inglewood.

3.3.1.1 Faults

According to the California Geological Survey (CGS), a fault is defined as "*a fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side* (Bryant and Hart, 2007)." CGS describes faults and fault zones as follows: "*Most faults are the result of repeated displacement that may have taken place suddenly and/or by slow creep. A fault is distinguished from those fractures or shears caused by landslides or other gravity-induced surface failures. A fault zone is an area of related faults that are commonly braided and subparallel, but may be branching and divergent. A fault zone has significant width (with respect to the scale at which the fault is being considered, portrayed, or investigated), ranging from a few feet to several miles* (SP42, CGS 2007)*"*

The City of Inglewood contains both active and potentially active faults. Southern California is a seismically active region and commonly experiences ground shaking from earthquakes along active faults. The State Mining and Geology Board define an active fault as one which has "*had surface displacement within Holocene time (about the last 11,000 years)"*. Figure 3-2 on the following page and Map 3 in Appendix D show the location of faults and their fault zones in Inglewood and surrounding areas.

The most significant fault located in Inglewood is the Newport-Inglewood fault. This fault stretches across the Los Angeles basin in a northwest-southeast direction from Beverly Hills to Newport Beach. The faulting type is right-lateral with local reverse slip associated with fault steps. The Southern California Earthquake Center (SCEC) estimates the strongest ground motion that could be generated by this fault or the maximum probable magnitude on the Richter scale is between M6.0 - 7.4. The most recent major fault rupture occurred in March 10, 1933, with a magnitude of M6.4 (SCEC, 2009). There was no surface rupture associated with this earthquake. Most of the damaged buildings were unreinforced masonry. Many school buildings were destroyed, but being closed at the time, there were no casualties. On May 17, 2009, a magnitude 4.6 earthquake occurred with an epicenter in the nearby community of Lennox. It is still being determined whether this event was associated with the Newport-Inglewood fault.

Figure 3-2: Active faults in Inglewood and surrounding Southern California region

3.3.1.2 Surface rupture

One of the major damaging effects of earthquakes is caused by sudden, large displacements of earth materials, also known as surface rupture (see Figure 3-3). During a seismic event, the ground may break along the surface trace of the fault if the intersection of the fault surface meets the earth's surface. Generally, surface rupture is anticipated to occur along pre-existing faults. Since there are no preventive measures to stop surface rupture, faults are identified with the purpose of delineating zones over the surface tract of potentially hazardous faults where construction should be avoided.

Under the Alquist Priolo (AP) Earthquake Fault Zoning Act of 1972, the State Geologist (Chief of the California Geological Survey/ CGS) is required to delineate "Earthquake Fault Zones" (EFZs) along known active faults in California. Cities and counties affected by the zones must regulate certain developments within the zones. They must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface rupture from future faulting. Map of AP fault zones affecting the City of Inglewood is presented in Appendix D, Map 3 Alquist Priolo Fault Zones. A section of the Newport-Inglewood fault extends through the city, runs roughly parallel to the San Andreas system and lies partly under the Pacific Ocean. Maps show this section of the fault passes through the Inglewood Civic Center, south of Centinela Creek. Another section of the Newport-Inglewood fault traverses the eastern portion of the City, in a northwest-southeast direction. There has been no history of any major surface rupture on any of these fault zones.

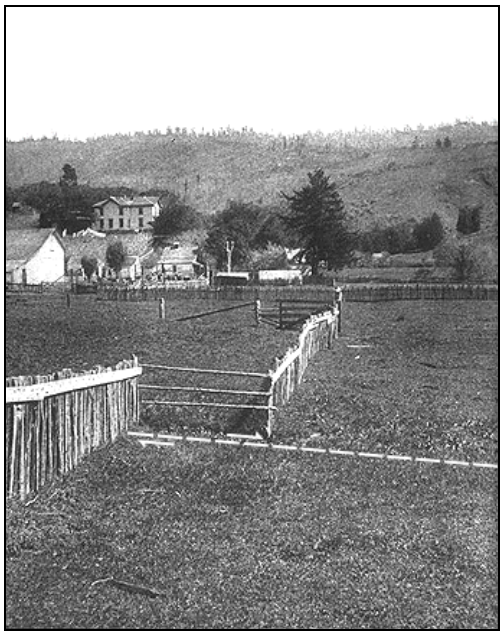


Figure 3-3: This photo shows a fence near Bolinas, Marin County, CA, offset about ten feet during the 1906 earthquake. *Photo courtesy USGS*

3.3.1.3 Ground shaking

A major cause of structural damage from earthquakes is ground shaking. The amount of motion expected at a building site depends on the distance to the fault, magnitude and depth of the hypocenter, and the geologic condition at the site. Greater movement can be expected at sites located on weak soils such as alluvium or soil along riverbeds. Structures that are most vulnerable to strong ground shaking are bridges, freeway overpasses and unreinforced masonry buildings. Secondary hazards such as liquefaction, landslide, fire, and dam failure are also associated with strong ground motion.

Numerous scales and measures exist for describing the amount of shaking that goes on during an earthquake. The Modified Mercalli Intensity (MMI) scale is a subjective ranking scale that illustrates the relationship between shaking intensity and the potential damage to man-made structures (See Table 3-3). This scale is composed of 12 increasing levels of shaking intensity that range from imperceptible shaking to extreme, designated by Roman numerals. An objective scale for expression of ground shaking is through Peak Ground Acceleration or PGA. It refers to the highest ground acceleration measured in a particular location (horizontal) during an earthquake and is generally reported using the unit “g” (unit of gravitational force) or the percentage of g. Table 3-3 below details how the MMI scale correlates with PGA in terms of perceived shaking and potential damage. Spectral Acceleration measures the acceleration at various spectra. These are used to characterize damage to different types of building structures.

MMI (PGA)	Perceived Shaking	Detailed Damage Description
I – III (<0.01)	Not felt - felt indoors on upper floors of buildings, but many people do not recognize it as an earthquake	None
IV (0.01-0.04)	During the day felt indoors by many, outdoors by few. At night, some awakened.	None
V (0.04-0.09)	Felt by nearly everyone, many awakened	Very light—Some dishes and windows broken; cracked plaster in a few places; unstable objects overturned.
VI (0.09-0.18)	Felt by all, many frightened	Light—Some heavy furniture moved; a few instances of fallen plaster and damaged chimneys.
VII (0.18-0.34)	Very strong	Moderate—Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken.
VIII (0.34-0.65)	Severe- Persons driving cars disturbed.	Moderate to heavy—Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Chimneys toppled.
IX (0.65-1.24)	Violent	Heavy— Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X (>1.24)	Extreme	Very heavy—Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations.

MMI (PGA)	Perceived Shaking	Detailed Damage Description
XI (>1.24)	Extreme	Extreme—Few, if any, (masonry) structures remain standing.
XII (>1.24)	Extreme	Extreme- Damage total

Table 3-3: Modified Mercalli Intensity (MMI) scale and PGA comparison (adapted from Wald et al. 1999)

Seismic hazard maps for the United States show the levels of ground shaking in terms of PGA. Figure 3-4(a) shows the national Peak Ground Acceleration (PGA) values for the United States with a 10% chance of being exceeded over 50 years (USGS, 2008). This is a common earthquake measurement that shows three things: the geographic area affected (all colored areas on the map), the probability of an earthquake of each given level of severity (10% chance in 50 years), and the severity (the PGA is indicated by color).

According to the United States Geological Survey (USGS), *"The National Seismic Hazard Maps are the basis for seismic design provisions of building codes, insurance rate structures, earthquake loss studies, retrofit priorities, and land-use planning. Incorporating these hazard maps into designs of buildings, bridges, highways, and critical infrastructure allows these structures to withstand earthquake shaking without collapse. Properly engineered designs not only save lives, but also reduce disruption to critical activities following a damaging event. By estimating the likely shaking for a given area, the maps also help engineers avoid costs from over-design in areas with unlikely levels of ground motion."*

Figure 3-4(b) shows the levels of horizontal shaking for California and Los Angeles basin. Colors on the maps indicate there is 10% probability in 50 years that PGA will exceed 0.3 – 0.4 g for the City of Inglewood. This represents shaking levels of VII or VIII intensity on the MMI scale (See Table 3-3 above).

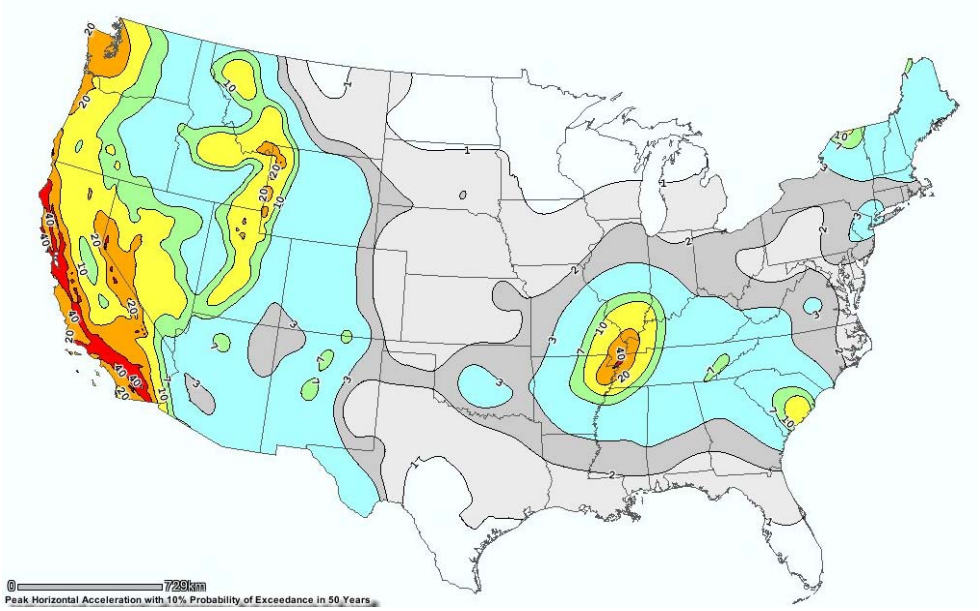


Figure 3-4(a): PGA (expressed as % *g*) with 10% probability of Exceedance in 50 years for United States

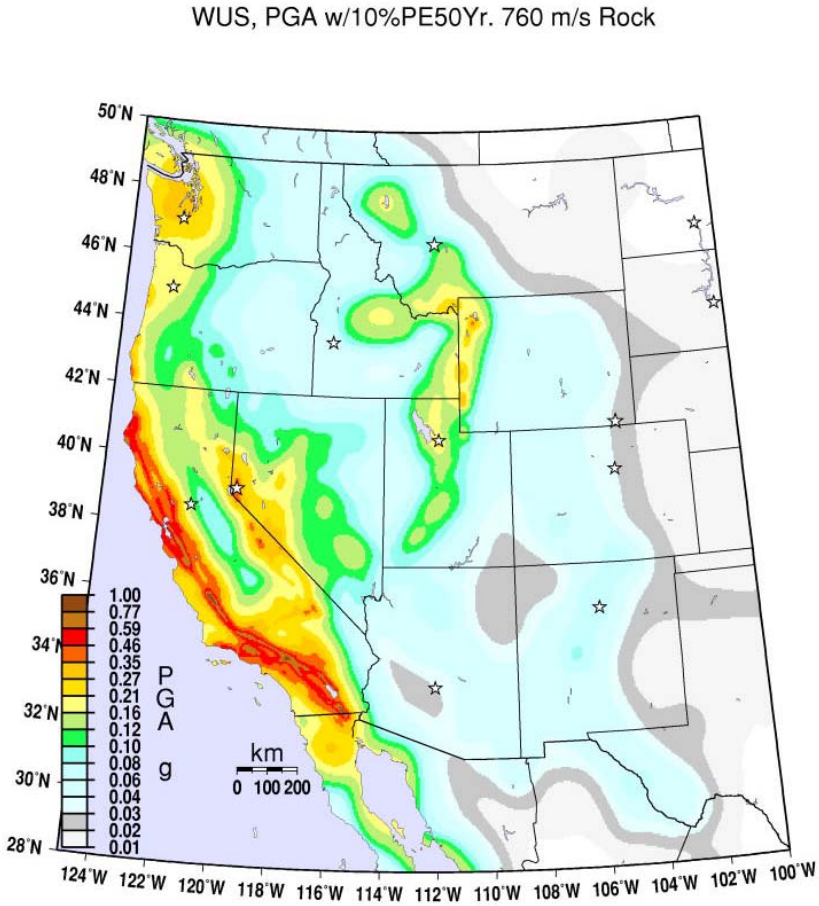


Figure 3-4(b): USGS PGA (expressed as % *g*) with 10% probability of Exceedance in 50 years for Western United States

3.3.1.4 Liquefaction

Liquefaction refers to a phenomenon in which surface soils, generally alluvial soils, become saturated with water. Ground shaking causes the soil grains to consolidate, pushing the water towards the surface and lessening the strength of the soil. Liquefaction susceptibility depends on the depth of the water table as well as the age and compactness of soil sediments. Water wells act to lower the water table in Inglewood, making the city's susceptibility to liquefaction low (see Appendix D, Map 4 and regional liquefaction map in Figure 3-5 below). The area surrounding Centinela Creek is the only area in the city which has a very high susceptibility rating. However, concrete culverts are in place to capture water runoff and, combined with the low water table of the area, help counteract the creek's effect on the area's liquefaction susceptibility level.

3.3.1.5 Landslides

Earthquake-induced landslide of a hillside slope is a concern in areas where the slopes are steep and unstable. Although not a major concern for the City of Inglewood (see Appendix D, Map 4 and regional landslide map in Figure 3-5), the hillside areas of the city are subject to landslide potential. Surface movements in the hillside area triggered by ground shaking could be exacerbated by rain, a breach in a reservoir, damage to potable water reservoirs or pumping facilities.

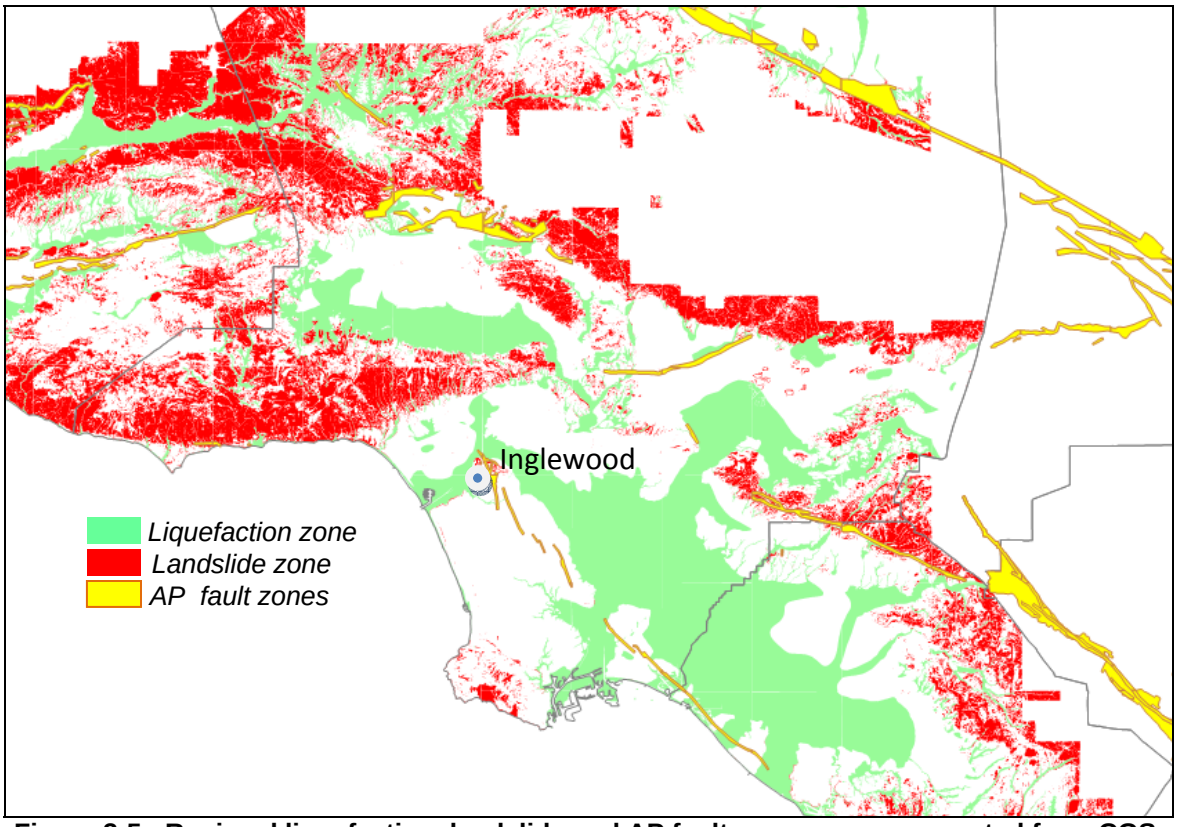


Figure 3-5: Regional liquefaction, landslide and AP fault zones map aggregated from CGS.

3.3.1.6 Historic Earthquake Events in the City of Inglewood and adjacent areas

This section summarizes the significant historic earthquake events that occurred in and around Inglewood. Since 1900, five earthquakes greater than M5.5 have occurred in the Los Angeles County region, resulting in fatalities. These are listed in Table 3-4 below including a 1920 event that affected Inglewood, followed by a brief discussion on each.

Date	Magnitude (Mw) and Description	Fatalities
1920-06-21	M 4.9 – Inglewood, California	0
1933-03-11	M 6.4 - Long Beach, California	120
1971-02-09	M 6.6 - San Fernando, California	65
1987-10-01	M 5.9 - Whittier Narrows, California	8
1991-06-28	M 5.6 - Sierra Madre, California	2
1994-01-17	M 6.7 - Northridge, California	60

Table 3-4: Significant earthquakes in the Los Angeles County area (last 80 years)

Note: Earthquake Information presented in Table 3-4 above and discussion below is summarized from USGS archive of historical United States earthquake (USGS, 2009)

M 4.9 Inglewood Earthquake, 1920

In 1920, a relatively minor earthquake hit the City of Inglewood and resulted in some building damage. According to Taber (1920), "the damage to buildings was due to poor construction rather than to the intensity of the vibrations. Thin brick walls built as fronts to wooden buildings and not tied in properly, toppled outward into the street. Poorly built brick cornices and fire walls along the fronts of buildings were shaken off."

M 6.4 Long Beach Earthquake, 1933

The Long Beach earthquake occurred on March 11, 1933 and was caused by a rupture in the Newport-Inglewood fault. This earthquake caused serious damage to weak masonry structures on land fill from Los Angeles south to Laguna Beach. Property damage was estimated at $40 million 1933 dollars, and approximately 120 people died. The earthquake was felt in the 10 southern counties of California and at some points farther to the northwest and north in the Coast Range, the San Joaquin Valley, the Sierra Nevada, and the Owens Valley. Severe property damage occurred in Compton, Long Beach, and surrounding towns in the area. School buildings were among the most damaged structures due to this earthquake. As a result of this earthquake, the State Legislature passed the Field Act, which now regulates building-construction practices in California.

M6.7 San Fernando Earthquake, 1971

This earthquake occurred on February 9, 1971 in a sparsely populated area of the San Gabriel Mountains, near the city of San Fernando. It lasted about 60 seconds, killing 65 people, injuring more than 2,000, and causing property damage estimated at $505 million. Major structures at the Olive View and the Veterans Administration Hospitals were severely damaged and freeway overpasses collapsed. Unreinforced masonry buildings collapsed at the Veterans Administration Hospital in San Fernando, killing 49 people. Many older buildings in the Alhambra, Beverly Hills, Burbank, and Glendale areas were damaged beyond repair and thousands of chimneys were damaged in the region. Public utilities and facilities of all kinds were damaged, both above and below ground.

M5.9 Whittier Narrows, 1987

The Whittier Narrows earthquake occurred on October 1, 1987. It killed eight people, injured several hundred, and damaged property estimated at $358 million in the East Los Angeles area, mostly in the city of Whittier. Business structures in the old Whittier commercial district were the most severely damaged with 12 commercial buildings destroyed and another 20 buildings declared unsafe. Several single family houses and apartments in Los Angeles, Orange, and Ventura Counties sustained major to complete damage. Property damage on the California State University, Los Angles campus (about 10 km west of the epicenter) was estimated at more the $20 million.

M5.6 Sierra Madre, 1991

The 1991 Sierra Madre earthquake caused damage in the Arcadia, Monrovia, Pasadena, San Marino and Sierra Madre areas, estimated at 33.5 million dollars. One person was killed in Arcadia and one person died from a heart attack at Glendale. At least 100 people were injured although most injuries involved only minor cuts and bruises. Maximum intensity of MMI VII was recorded in Arcadia, Monrovia, Pasadena and Sierra Madre. Some rockslides occurred on mountain roads. The earthquake was felt strongly throughout much of southern California, from Santa Barbara to San Diego and east as far as the Palm Springs-Indio area.

M6.7 Northridge, 1994

The most recent and damaging earthquake to hit southern California was the Northridge earthquake which occurred on January 17, 1994. Sixty people were killed, more than 7,000 were injured, and 20,000 people were rendered homeless. More than 40,000 buildings were damaged in Los Angeles, Ventura, Orange and San Bernardino Counties. Severe damage occurred in the San Fernando Valley. Maximum intensities of MMI IX were observed in and near Northridge and in Sherman Oaks. Significant damage occurred at Fillmore, Glendale, Santa Clarita, Santa Monica, Simi Valley and in western and central Los Angeles. The Anaheim Baseball Stadium also sustained damage. Collapsed overpasses closed sections of the Santa Monica Freeway, the Antelope Valley Freeway, the Simi Valley Freeway and the Golden State Freeway. Fires caused additional damage in the San Fernando Valley and in Malibu and Venice. Estimates of damage have ranged between 24 and 44 billion dollars (Seligson and Eguchi, 2005).

3.3.2 Hazardous Materials Release

According to the US Department of Transportation, a hazardous material is *"Any substance or material that is considered to have the capability to cause an unreasonable risk to human health or safety or the environment when transported in commerce, used incorrectly, or if not properly stored or contained is considered a hazardous material."* Hazardous materials include hazardous substances or wastes. They also include any material that a business or local agency reasonably believes would be injurious to the health and safety of persons or harmful to the environment if released. City businesses, public and private institutions and private households all use or generate hazardous materials. Federal, state, and local agency databases maintain comprehensive information on facilities that use large quantities of hazardous materials, as well as facilities that generate hazardous waste. Some of these facilities use certain classes of hazardous materials that require accidental release scenario modeling and risk management plans in order to protect surrounding land uses.

Hazardous materials are routinely manufactured, used, stored or transported in nearly every community in the US. Hundreds of hazmat release incidents occur annually and involve damage to human and wildlife, expensive cleanup costs and sometime loss of

lives. Hazardous materials are often released as a result of transportation accidents during routine transfer via highways or pipelines (see Section 3.2.2.1: transportation of hazardous material and 3.2.2.2: Oil and gas pipelines). Hazmat release from fixed site sources (see Section 3.2.2.3: Fixed site facilities) as a secondary impact of earthquake hazard is a major threat for an industrialized and densely populated city such as Inglewood. Figure 3-6 below shows a hazardous materials release caused by the 1999 magnitude 7.4 Izmit, Turkey earthquake. The following sections provide information on hazardous materials use and potential release threats from various sources within the City of Inglewood.

Figure 3-6: Earthquake damage can cause releases of hazardous materials from refineries and other chemical storage and distribution systems, research and industrial laboratories, manufacturing plants, and railroad tank cars. Source: US Geological Survey

3.3.2.1 Transportation of hazardous materials

Major freeway routes, I-405 (north-south) and I-105 (east-west) and truck routes (Florence- La Cienega and Century-La-Cienega) traverse the city where hazardous materials are routinely transported. With the exception of high-level radioactive materials and certain poisons and explosives, all classes of hazardous materials can be transported on roadways in Inglewood (General Plan update, 2006). However, because Section 31303 of the California Vehicle Code and U.S. Department of Transportation regulations require that routes with the least overall travel time transport hazardous materials, many of the local streets in the city are not used for the transport of hazardous materials. In addition to the demand of hazardous materials within the city, significant amounts of hazardous materials are in transit through Inglewood to other destinations.

	Incidents	Accidents	Radioactive material related	Hazardous Waste
Total	148,257	3,122	74	1,983
fatalities	120	95	1	0
injuries	1,543	187	0	61
Damage ($)	457,768,531	347,342,582	2,130,179	10,516,835

(a) Highway incidents

	Incidents	Accidents	Radioactive material related	Hazardous Waste
Total	8,410	483	6	214
fatalities	18	14	0	0
injuries	1,121	743	0	11
Damage ($)	169,744,517	149,425,622	0	3,020,346

(b) Rail incidents

Table 3-5: Hazardous Materials Safety Incidents Statistics 1999-2008, for All (a) Highways and (b) Rail in the United States (as of 5/13/09). Source: US Department of Transportation, http://www.phmsa.dot.gov/hazmat/library/data-stats/incidents

Table 3-5 above presents the national statistics for hazardous materials incidents on highways and railroad between 1999 and 2008. Of the 148,257 highway incidents reported, 3122 were vehicular accidents. 74 incidents were radioactive material related while 1,983 involved hazardous waste. There were 120 fatalities within this reporting period and a total damage cost of about $457.7 million. For railroad incidents, of the total 8,410 incidents reported 483 were accidents. 6 incidents were radioactive material related while 214 involved hazardous waste release. There were 18 fatalities within this reporting period and a total damage cost of about $ 170 million. Although these are national level numbers, the rate of fatalities and cost per incident may be used in conjunction with local factors such as railroad tracks or highway miles and frequency of trains and trucks to estimate risk of hazardous materials release.

Specifically for the City of Inglewood, the following incidents (Table 3-6) were logged in the hazmat materials safety online database: https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Search.aspx. None of these events had any severe consequence.

Date	Mode of transport	Carrier/ Reporter	Shipper	Commodity	Release Qnty (LGA)
10/8/1999	Highway	AMERFORD FMS INC	U S GOVT - GSA	CORROSIVE LIQUIDS, TOXIC, N.O.S.	5
10/18/2000	Highway	EMERY WORLD	UTILIX CORP	FLAMMABLE LIQUIDS, N.O.S.	0.066043

Date	Mode of transport	Carrier/ Reporter	Shipper	Commodity	Release Qnty (LGA)
		WIDE			
7/27/2003	Highway	EMERY WORLD WIDE	HONEYWELL INC	FLAMMABLE LIQUIDS, N.O.S.	0.066043
3/3/2004	Highway	ABF FREIGHT SYSTEM INC	ELDORADO CHEMICAL CO	CHROMIC ACID SOLUTION	0.039063
3/11/2005	Highway	MENLO WORLDWIDE FORWARDING - A UPS COMPANY	FREEMAN TRANS GROUND	AEROSOLS, FLAMMABLE, (each not exceeding 1L capacity)	N/A

Table 3-6: Hazmat release incidents in the City of Inglewood (1999-2008)

3.3.2.2 Oil and Gas pipelines

The only remaining active oil well site within the City of Inglewood is the seven-acre Brea Oil Company site at Eucalyptus Avenue and Hyde Park Boulevard. This site has multiple oil wells, however, any oil or gas extracted are not stored onsite, but are piped directly to refineries outside of the city.

Figure 3-7 below illustrates the major lifeline facilities and pipelines in the City of Inglewood. Two major crude oil pipelines pass through western Inglewood, one 12-inch pipe and one 16-inch pipe. These pipelines transport crude oil through the city to refineries located outside city boundaries. Virtually all streets within the city have buried gas pipeline underneath. The Public Utilities Commission (PUC) regulates Southern California Gas and is the default provider, required by State law, for natural gas delivery to Inglewood.

Damage to oil pipelines and facilities establishes a potential fire hazard. Fires may result from accidents or earthquakes.

Figure 3-7: Major Facilities, Lifelines, and Fault Zones in Inglewood

3.3.2.3 Fixed site facilities

Hazardous materials are located throughout the City of Inglewood. Data and information on current or potential hazardous waste sites were compiled from several State and Federal databases (see Section 3.4 for detailed inventory of hazmat sites). The following sources of hazardous materials data for the City of Inglewood were used to evaluate the nature of and extent of the hazard:

1. *Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS).* Under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) the United States Environmental Protection Agency (EPA) maintains a list, known as CERCLIS, of all contaminated sites in the nation that have in the past or are currently undergoing clean-up activities.

2. *Cortese List. The Hazardous Waste and Substances Sites (Cortese) List is a tool used by* the state and local agencies and developers to comply with the *California Environmental Quality Act* (CEQA) requirements in providing information about the location of hazardous materials release sites.

3. *DTSC Site Mitigation and Brownsfield Reuse Program ("CalSites") Database. The Site* Mitigation and Brownsfield Reuse Program serves to cleanup and redevelop Brownfield sites for future use. Brownfields are properties that are contaminated, or thought to be contaminated, and are underutilized due to remediation costs and liability concerns. Often the remediation cost associated with a contaminated site serves as a major deterrent to any planned reuse of that site.

4. *Regional Water Quality Control Board (RWQCB) Spills, Leaks, Investigations, and Cleanup (SLIC) List.* The SLIC Program was established by the State Water Resources Control Board (SWRCB) to allow each of its nine Regional Boards to oversee the cleanup of illegal discharges, contaminated properties, and other unregulated releases adversely impacting the state's waters. Sites managed within the SLIC Program include sites polluted as a result of recent or historic spills, subsurface releases (e.g., pipelines, sumps), complaint investigations, and all other unauthorized discharges that pollute or threaten to pollute surface and/or ground waters that come to the attention of the program.

5. *Los Angeles Regional Water Quality Control Board's (LARWQCB) Leaking Underground Fuel Tank (LUFT) database.* The LARWQCB maintains an Underground Storage Tank Program (UST Program) that deals specifically with leaking fuel tanks.

6. *Los Angeles County Fire Department database.* The Los Angeles County Fire Department maintains a list of all the sites that use hazardous chemicals within the City of Inglewood. The LACFD provided the city with this information for use in this project.

3.3.2.4 Regulatory setting for hazmat release mitigation and prevention

Several regulatory programs exist at the federal, state, and local levels to regulate and manage hazardous materials for the City of Inglewood. These programs are summarized in this section to provide a high-level understanding of potential problems associated with hazardous materials.

At the federal level, the various agencies that administer such programs include the U.S. EPA, the Occupational Safety and Health Administration (OSHA), and the Department of Transportation (DOT). Applicable federal regulations are contained primarily in Titles 10, 29, 40, and 49 of the Code of Federal Regulations (CFR). The U.S. DOT has developed regulations pertaining to the transport of hazardous materials and hazardous wastes by all modes of transportation. The U.S. Postal Service (USPS) has developed additional regulations for the transport of hazardous materials by mail. DOT regulations specify packaging requirements for different types of materials. EPA has also promulgated regulations for the transport of hazardous wastes. These more stringent requirements include tracking shipments with manifests to ensure that wastes are delivered to their intended destinations.

In California, the state Environmental Protection Agency (Cal/EPA) has broad jurisdiction over hazardous materials management in the state. Within Cal/EPA, the Department of Toxic Substances Control (DTSC) has primary regulatory responsibility for hazardous waste management and cleanup. Enforcement of regulations has been delegated to local jurisdictions that enter into agreements with DTSC for the generation, transport, and disposal of hazardous materials under the authority of the Hazardous Waste Control Law. Along with the DTSC, the Regional Water Quality Control Board (RWQCB) is responsible for implementing regulations pertaining to management of soil and groundwater investigation and cleanup. RWQCB regulations are contained in Title 27 of the CCR. Additional state regulations applicable to hazardous materials are contained in Title 22 of the California Code of Regulations (CCR). Title 26 of the CCR is a compilation of those sections or titles of the CCR that are applicable to hazardous materials.

Several regional and local programs for hazmat release prevention and mitigation apply to the City of Inglewood. Among them are the Cal/EPA's "Unified Hazardous Waste and Hazardous Materials Management Regulatory Program", the California Accidental Release Prevention Program (CalARP), and programs related to transportation of hazardous materials, investigation and cleanup of contaminated sites, and the California Educational Code for siting schools. City of Inglewood's general plan addresses all these programs in detail (City of Inglewood General Plan Update, 2006).

The California Highway Patrol (CHP) and California Department of Transportation (Caltrans) are the enforcement agencies for hazardous materials transportation regulations. Transporters of hazardous materials and waste are responsible for complying with all applicable packaging, labeling, and shipping regulations. The California Emergency Management Agency (CalEMA) also provides emergency response services involving hazardous materials incidents.

The Los Angeles County Fire Department's (LACFD) Health Hazardous Material Division (HHMD) protects the public health and the environment throughout Los Angeles County, including Inglewood, from accidental releases and improper handling, storage, transportation, and disposal of hazardous materials and wastes. The LACFD does this through coordinated efforts of inspections, emergency response, enforcement,

and site mitigation oversight. The department provided the project team with the list of sites in the City of Inglewood using hazardous materials, including quantities and types. For the classes of chemicals and aggregate quantities see Table 3-11 in Section 3.4 Inventory Assets.

3.3.3 Human Threat Events/ Terrorism

The last decade has ushered in a heightened awareness of terrorism both internationally and nationally. The bombing of a Bali nightclub in 2002, the subway bombing in Spain in 2004, the subway and bus bombings London in 2005, as well as the bombing of the Oklahoma Federal Building in 1995 and the events of September 11, 2001 in our own nation have demonstrated the need for increased security in numerous arenas. The duty to protect our nation from both domestic and international terrorist threats falls on the shoulders of the federal government in the form of the Department of Homeland Security as well as state and local authorities.

3.3.3.1 Regional threats and targets

Los Angeles County is an economic powerhouse, encompassing many industries, from the ports of L.A. and Long Beach to the motion picture and television studios. This enormous economic influence, coupled with a population estimated to be close to ten million people, makes Los Angeles an attractive target for terrorists. Former Department of Homeland Security Tom Ridge warned, "…*high-visibility, high-density urban areas may be at extra risk for terrorism, and therefore deserve extra protection.*"

Public transportation has been a favorite target for terrorists globally. Addressing the U.S. House of Representatives Committee on Homeland Security, Subcommittee on Transportation Security and Infrastructure Protection, Thomas Lambert said, *"…the fact that our transit systems are open to the public with many access points, and add the historical precedent of repeated attacks overseas on surface transit; one can clearly see that our transit systems, left unsecured, are viable and attractive targets for terrorists."* Los Angeles has a complex web of freeways, bus lines, light rail lines, subways, and commuter rail lines. The (MTA), which operates bus, light rail and subway services, averages 1.4 million transit trips per weekday.

Places where large crowds gather are vulnerable to attack. According to the Los Angeles Fire Department, "S*porting events, political conventions and other special events (are) appealing target (to terrorists)".* L.A. County is home to many large arenas, such as the Staples Center, the L.A. Convention center and the Rose Bowl. Similarly, "S*ince the WTC attack federal officials have issued specific warnings for elevated terrorism risk in shopping malls, banks, and multifamily housing."*

Los Angeles International Airport, which is adjacent to Inglewood, has been the intended target of terrorist plots in the past (discussed further in Section 3.3.3.2) and is regarded as one of Los Angeles County's most vulnerable locations.

Water treatment plants and utilities are also of special concern for authorities. In 2003, The Congressional Research Service reported to Congress that *"There is evidence that Al Qaeda is interested in the vulnerabilities of the U.S. public and private utilities."* The C.R.S. further explains that such an attack could be in the form of a cyber-attack on the utility control system or a physical attack, such as a bombing. A combination of both attacks together would cause the greatest damage to the community.

3.3.3.2 Local threats and targets

As a vital part of Los Angeles County, the City of Inglewood has numerous terrorism-related security issues to address. Inglewood has a fairly large population. The Census Bureau estimated the population of Inglewood to be 113,376 in 2007. The public transportation in the city includes light rail lines and bus routes and according to the City of Inglewood's webpage, the city is "surrounded by Interstates 405, 105, 110, and 10" and is "served by Union Pacific & Burlington Northern Santa Fe rail lines." These are all vulnerable to terrorist attack.

Public buildings and lifeline

The public utilities of the city that need to be safeguarded include water treatment plants, power lines and grids and natural gas lines. There are also areas in the city housing hazardous materials that are potential targets for attack or theft by terrorists. Government buildings of significance in Inglewood include City Hall and the Los Angeles Superior Courthouse.

High density population centers

The Forum, which features large concerts and sporting events and can seat up to 17,800 people is located in Inglewood. Hollywood Park horse racing track and Casino also draw large crowds and pose a security threat.

Los Angeles International Airport/ LAX

One of the greatest security concerns is Inglewood's close proximity to Los Angeles International Airport. There have been numerous substantiated threats to LAX in the past. In 2000, Ahmed Ressam was intercepted with a trunk full of explosives. He was later *"…convicted of conspiring to detonate the explosives at Los Angeles International Airport."* In a separate case, the Department of Justice said that documents of a domestic terrorist cell that was plotting an attack in Los Angeles revealed that they "…researched targets and prepared a document called 'Modes of Attack.'" The document listed LAX among their intended targets. A terrorist attack in the airport could impact Inglewood directly. Inglewood is also a potential staging ground for an emergency response effort to such an attack.

3.4 Inventory Assets

Step three in the risk assessment process involves inventorying assets located in the community. Section 3.3 profiled the hazards in Inglewood. This information was used to identify the assets at risk from those hazards. Some hazards (such as earthquakes) may affect the entire community while some affect limited areas (hazmat release incidents). This section provides a description of the inventory development and prioritization process.

3.4.1 Collection of general inventory data

Table 3-7 provides a summary of the data sources used to develop the general inventory. The text in the table discusses how each data layer was used in the vulnerability assessment presented in Section 3.5.

	Data Source	Data Layers	How the data layers are used in the plan
1	City of Inglewood GIS	i. Contours ii. Neighborhoods iii. Building footprint iv. Public buildings v. Schools vi. Soil vii. Fault viii. Jurisdiction boundary ix. Parcels x. Street Network xi. Traffic diversion	a. Buildings and School locations- Geographical location of the building (e.g., address and latitude/longitudinal coordinates of site
2	United States Census	i. Population	a. Population distribution and exposure

	Data Source	Data Layers	How the data layers are used in the plan
3	HAZUS®	i. General building stock ii. Public buildings iii. Hospitals iv. Schools v. Police vi. Fire vii. Potable water viii. Waste water ix. Electric power x. Oil xi. Natural gas xii. Telecommunication xiii. Hazmat sites xiv. Highways, roads, and bridges xv. Railroads xvi. Light rail xvii. Airports	a. Building Location – Geographical location of the building (e.g., address and latitude/longitudinal coordinates of site b. Building Occupancy – Number of people using the building during the day and at night; percentage of the building owner occupied c. Building Size – Gross square footage, the number of floors and height of the building d. Replacement Value – Replacement value of the building, contents (and/or business inventory) e. Loss of Function Cost – Financial data and costs associated with loss of building function, including business income, wages paid, and relocation costs due to disruption of operation and rental of temporary space f. Structural Type- Building structure and construction information

Table 3-7: General Inventory Data Layers for Inglewood, Updated with Local Data

3.4.2 Prioritization and collection of additional inventory data

Additional inventory data were collected to augment the initial list of general inventory presented in Table 3-6. The prioritization process to determine whether a particular inventory should be updated depended on the following three factors (see Figure 3-8):

1. Is the given asset a primary contributor to economic losses?
2. Is the general inventory for an asset complete and comprehensive?

3. Is there better data (more precise and/or robust) readily available for the community?

These elements were considered together when assessing update priority. This step in the risk assessment process presents a complex challenge, as it can stretch resources. However, using a quantitative tool such as HAZUS® (FEMA/DHS 2002 is elemental in creating meaningful level 2 loss estimates (discussed in section 3.5). The various building and lifeline components analyzed by HAZUS® vary in terms of the magnitude of their contribution to the total loss. For example, light rail tracks are unlikely to contribute significantly to the losses for most HAZUS® scenarios, and as such, the default data provided with HAZUS® is suitable for these purposes. However, building data, if not adequately reflected in the default building stock, can produce misleading losses depending on the event. An update to this type of default data produces more realistic results. As such the prioritization scheme discussed in this section was used to update the default building data in HAZUS® for Inglewood.

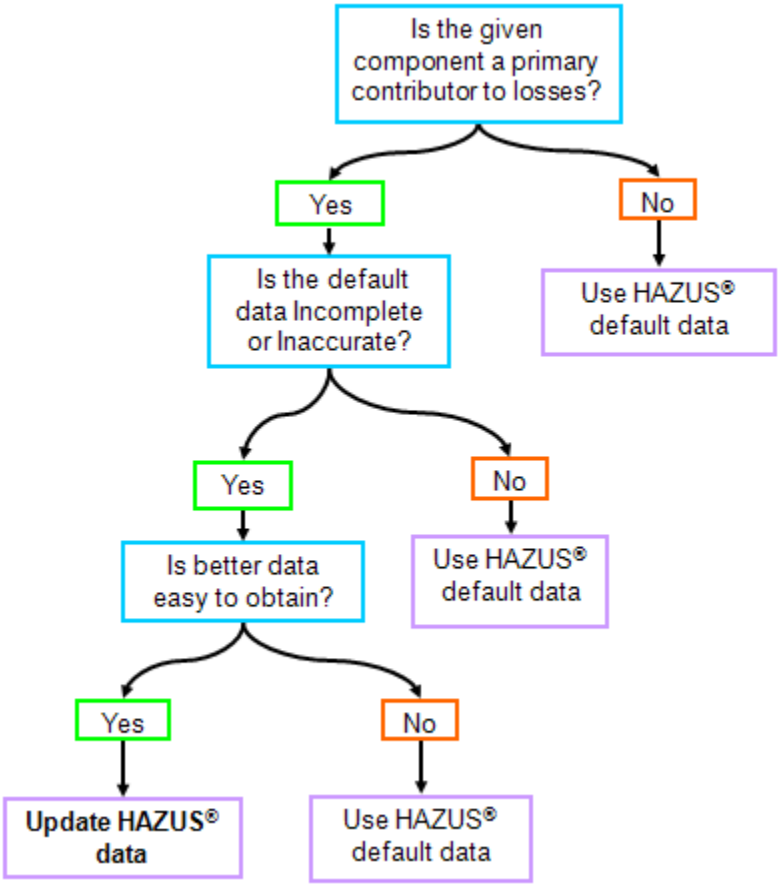


Figure 3-8: Prioritization steps to determine whether to collect additional inventory data

Based on the prioritization steps, the following additional data and reports were obtained to complete the asset inventory process and enable a comprehensive risk assessment in Section 3.5:

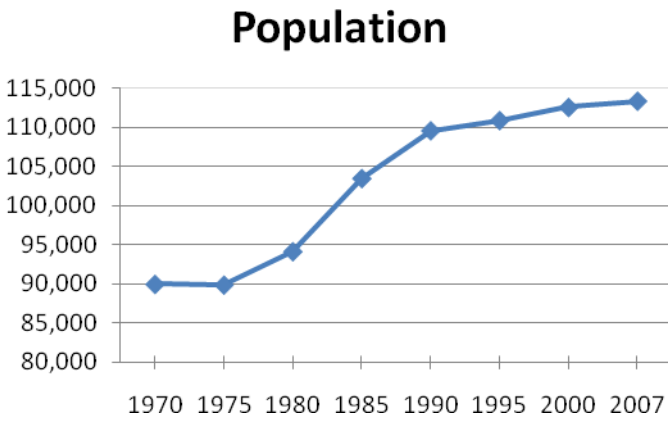
1. Building square footage data from County Tax Assessor's files
2. List of Hazardous Materials Sites from Los Angeles County Fire Department
3. Unified School District School and enrollment information
4. Structural and Seismic Evaluation reports of City Hall and City Service Center
5. Sanford M. Anderson Treatment Plant Plume modeling report

Detailed descriptions of each asset type are presented in the following sections.

3.4.3 Population

The population statistics for the City of Inglewood are based on US Census data (2007). Inglewood has a total population of 113,376 and an average household size of 3.06. Approximately 29.5% of the population is under the age of 16 and 7.4% is over the age of 65. The median household income was $40,110 in 2007 with 20.3 percent of the population living below the poverty level.

Figure 3-9 illustrates the population growth for the City of Inglewood from 1970 to 2007; in this period of time, the average annualized growth rate was 0.7 percent.



Year	1970	1975	1980	1985	1990	1995	2000	2007
Population	89,985	89,900	94,162	103,500	109,602	110,900	112,580	113,376

Figure 3-9: Population Growth: 1970-2007 Source: US Census Bureau

As shown in the figure above, less growth occurred in the period from 1970 to 1980; the increase in population from 89,985 in 1970 to 94,162 in 1980 represents an increase of 4,177, or an average annualized growth rate of 0.46 percent. The most rapid rate of growth occurred in the 1980's when the population grew from 94,162 in 1980 to 109,602

in 1990. This increase of over 15,000 represents more than 15 percent increase in the total population or an average annualized growth rate of 1.53 percent. The population growth leveled off considerably in the 1990's and between 1990 and 2007 the population grew from 109,602 to 113,376 in 2007; this equates to an average annualized growth rate of only 0.2 percent. Given that there has not been geographic expansion of the city, land use planning is not a major concern. However, several development projects planned for the city such as, Hollywood park and police department head quarters may need to consider the existing hazard zones identified in the plan.

The impacts of natural hazards in terms of ability to recover vary greatly among the population. As the events associated with the hurricane Katrina in the Gulf Coast have shown, vulnerable populations, including seniors, disabled citizens, women, and children, as well as those people living below the poverty level, are often disproportionately impacted by natural hazards. Inglewood is a densely populated city with a large, vulnerable population. The high unemployment rate along with the general lack of training and workforce development programs (City of Inglewood General Plan Update, 2006) create a population that generally has fewer resources to prepare their homes for a disaster or to take care of themselves without assistance after an event.

3.4.4 Buildings

The buildings identified in the inventory of assets for Inglewood include general and public buildings.

3.4.4.1 General building stock

HAZUS® default building inventory indicates there are about 27,000 buildings in the City of Inglewood, and a total estimated replacement value of buildings of $5.6 billion, excluding building contents. Approximately 87% of the buildings are residential, and 76% of the building value is associated with residential housing. The City of Inglewood has a relatively old housing stock compared with other neighboring cities in Los Angeles County. More than 50 percent of all occupied housing units were built prior to 1960. More than 80% of the structures are wood. Table 3-8(a) and (b) provide the building counts by occupancy and structure type for the City of Inglewood (HAZUS®).

Occupancy/ Use	Building Count	Percentage
Single Family	20,991	76.2%
Other Residential	2,973	10.8%
Commercial	3,476	12.6%
Education	23	0.1%
Government	10	0.04%
Industrial	56	0.2%
Religion	17	0.1%
Total	27,527	100%

Table 3-8(a): Building Count by Occupancy

Structure Type	Building Count	Percentage
Wood	23,117	83.9%
Steel	1,329	4.8%
Concrete	806	2.9%
Precast	247	0.9%
RM	1,524	5.5%
URM	279	1.0%
MH	244	0.9%
Total	27,527	100%

Table 3-8(b): Building Count by Occupancy

3.4.4.2 Public buildings

Inglewood's public buildings have civic, government, or institutional uses and include City Hall, the Los Angeles County Courthouse, the Senior Center, the City Service Center, libraries, and churches. The inventory of public buildings was created from data provided by the city and default HAZUS® database.

The Newport-Inglewood fault extends through the city, runs parallel to the San Andreas system and lies partly under the Pacific Ocean. The Newport-Inglewood fault runs under the Inglewood Civic Center (Figure 3-9) and in very close proximity to several other important city facilities. Tables 3-9(a) and (b) provide lists of Government facilities located in the fault and liquefaction zones respectively. A summary of the seismic evaluation of the city hall and the city center buildings is provided in Appendix E. The intent of the evaluation was to ensure that both the buildings meet the level of performance required to safeguard against major structural failure or loss of life. It was also to determine the need (2001 California Building Code and FEMA requirements) for seismic retrofit of structural members of the lateral force resisting systems. The evaluation concluded that the risk to life safety solely due to the threat of ground motion in both buildings is low. It is unknown whether there has been a geologic study to determine the threat of fault rupture to critical facilities. It is quite possible that a geologic study will determine fault conditions underneath City Hall that make structural mitigation critical to protect life safety.

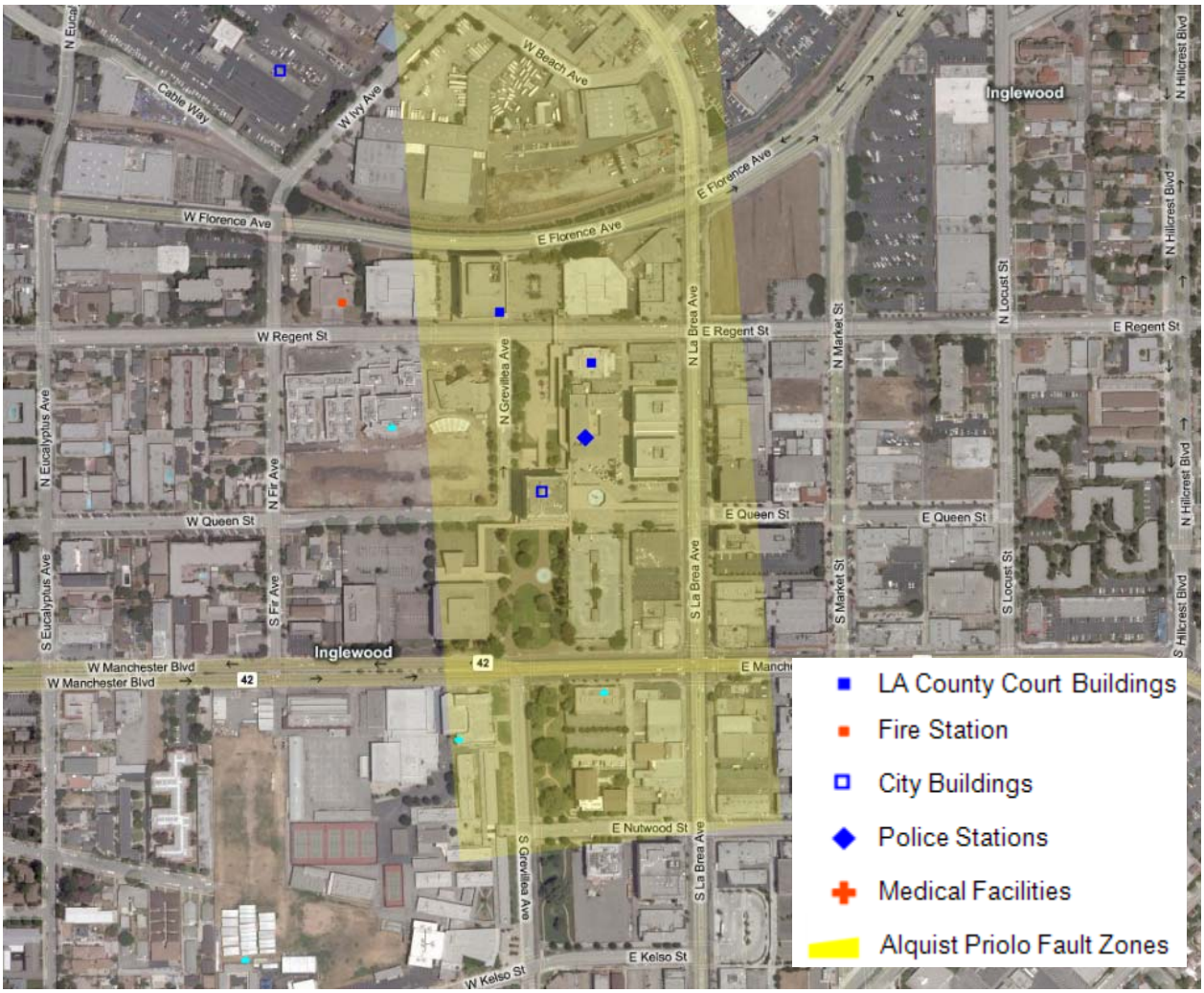


Figure 3-9: The Newport-Inglewood passes through the Inglewood Civic Center and in very close proximity to several other important facilities in the city

PARCEL NO	BUS ADDRESS	BUILDING USE	OWNER NAME
4013025900			INGLEWOOD CITY
4013029901			INGLEWOOD CITY
4012032903			INGLEWOOD CITY
4016011900			INGLEWOOD WATER
4016021902	621 N LA BREA AV		STATE OF CALIF
4013028900			INGLEWOOD CITY
4016030900			LACMTA
4016030902			LACMTA
4015028903	237 N MARKET ST		REDEVELOPMENT A
4015028900	205 N MARKET ST		REDEVELOPMENT A
4015018900			LACMTA

PARCEL NO	BUS ADDRESS	BUILDING USE	OWNER NAME
4020022915			L A COUNTY
4015029901			COUNTY OF LOS A
4020024913			INGLEWOOD CITY
4020025900	231 S GREVILLEA AVE		INGLEWOOD UNIFI
4012032908	720 E FLORENCE AVE		FIRST CONGREGAT
4021008901	110 E REGENT ST		LA COUNTY
4021015016	315 S MARKET ST		BUILDING MANAGE
4021015904	320 S LA BREA AV		INGLEWOOD CITY
4021009909			REDEVELOPMENT A
47021015015	315 S MARKET ST		BUILDING MANAGE
4021015901			INGLEWOOD CITY
4021008911			INGLEWOOD CITY
4025017900			INGLEWOOD CITY
4027015900			INGLEWOOD CITY
4029021900	2301 W CULLIVAN ST		L A UNIFIED SCH
4030033900	10711 S 10^{TH} S		INGLEWOOD UNIFI
4025011900			INGLEWOOD CITY
4012031929	720 FLORENCE AV		FIRST CONGREGAT
4020022914			INGLEWOOD CITY
4015028902	228 N LA BREA AVE		REDEVELOPMENT A
4020023900	151 N GREVILLEA AVE		INGLEWOOD UNIFI
4020024914			L A COUNTY

Table 3-9(a): Government buildings located in the AP fault zone (detailed attribute data maintained by the City of Inglewood)

PARCEL NO	BUS ADDRESS	OWNER NAME
4013025900		INGLEWOOD CITY
4013029901		INGLEWOOD CITY
4017032906		INGLEWOOD CITY
4013028900		INGLEWOOD CITY
4017032270		L A CITY STEVE
4017032910		INGLEWOOD CITY
4017032902	320 W BEACH AVE	INGLEWOOD CITY
4017032911		INGLEWOOD CITY
4017010146	719 N EUCALYPTUS AV #008	LINDO, MARTIN D
4015013901	416 N EDGEWOOD ST	INGLEWOOD UNIFI
4017010147	719 N EUCALYPTUS AV #021	WILLIAMS, SHIRL
4015017900		CO SANITATION D
4016023902		INGLEWOOD CITY
4017032901		INGLEWOOD CITY

PARCEL NO	BUS ADDRESS	OWNER NAME
4103024901		L A CO FLOOD CO
4103024900		L A CO FLOOD CO

Table 3-9(b): Government buildings located in the CGS liquefaction zone (detailed attribute data maintained by the City of Inglewood)

3.4.5 Critical Infrastructure and Critical Facilities

Critical infrastructure and critical facilities include hospitals, schools, police stations, fire stations, utility lifelines, hazmat sites and transportation systems.

3.4.5.1 Hospitals

Centinela Hospital, located at 555 East Hardy Street, is a 370 bed, full-service acute care medical center. Set up as a first receiver and a mass-casualty facility, the medical center and related support operations serve the City of Inglewood and its neighboring cities and facilities. Close proximity to Los Angeles International Airport (LAX) and several major freeways makes it a critical infrastructure in times of emergencies and response to disaster events. It is made even more critical by the fact that it is the only medical facility with an emergency room operating in the City of Inglewood. The nearest emergency rooms to Centinela Hospital are approximately ten miles away. These alternatives are the St. Francis Medical Center in Lynwood, the Ronald Reagan UCLA Medical Center in Los Angeles, and the Santa Monica UCLA Medical Center and Orthopedic Hospital in Santa Monica. In an emergency situation, the extra drive time to one of these other facilities, if even possible, would risk the lives of Inglewood residents.

3.4.5.2 Schools

The Inglewood Unified School District has thirteen elementary schools and six secondary schools, many of which are on a year-round schedule. The district serves approximately 17,750 students (in kindergarten through 12th grade). In addition, there is one preschool center with approximately 300 students and a community adult school with approximately 8,000 students. See Appendix F for City of Inglewood 2008-2009 Schools in the Inglewood Unified School District. None of the schools in the city are located in the liquefaction zone; however, the following five schools fall within fault zones (Table 3-10).

School	Address
Child Development Center/Latchkey/Head	10409 10th Ave, Inglewood, CA 90302
Crozier Middle School (6-8)	120 W. Regent Street, Inglewood, CA 90301
Inglewood Adult School	106 E. Manchester Avenue, Inglewood, CA 90301
Inglewood High School (9-12)	231 S. Grevillea, Inglewood, CA 90301
Clyde Woodworth Elementary (K-5)	3200 W. 104th Street, Inglewood, CA 90303

Table 3-10: Schools falling within AP fault zone

3.4.5.3 Police Stations

The Inglewood Police Department (IPD) operates one police station located at Manchester Boulevard next to the City Hall, three Police community centers and one Police substation (See Map 8 in Appendix D). The Law Enforcement Incident Command System, the Master Mutual Aid Plan, and the Standardized Emergency Management System are used to coordinate response to local and state emergencies (General Plan Update Aug-2006, pp 6.6-1- 6.6-9).

3.4.5.4 Fire Stations

Since November 2000, the Los Angeles County Fire Department (LACFD) has provided protection and paramedic services for the City of Inglewood. LACFD currently provides the following emergency services: fire suppression, hazardous materials protection, emergency medical treatment including basic and advanced life support transportation, earthquake and fire safety planning, fire inspections and building plan reviews. The City of Inglewood is under the jurisdiction of Battalion 20 within Division 6 of the County of Los Angeles Consolidated Fire Protection District. Five of the six fire stations operated by Battalion 20 serve the City of Inglewood. Of these stations, four are located within the City of Inglewood, as shown in Map 8 in Appendix D and one is located within the unincorporated County territory of Lennox.

3.4.5.5 Utility Lifelines

Utility lifelines include potable water system, waste water system, electric power system, natural gas, oil, and telecommunication systems.

Potable Water System

Inglewood's potable water system consists of 152 miles of pipe, three active wells, and a water treatment plant. The city has two reservoirs – North Inglewood and Morningside. The North Inglewood Reservoir was constructed in 1974 and has a total

capacity is 4.6 million gallons. The Morningside Reservoir was constructed in 1954, and has a total capacity of 16 million gallons.

The Sanford M. Anderson Treatment Plant (Anderson Treatment Plant), a three acre site, is located on the southwest corner of Eucalyptus Avenue and Beach Avenue, and was constructed to treat the city's groundwater for iron and manganese. Currently, the Anderson Treatment Plant has a capacity of 8.64 million gallons per day (MGD) and a clear well capacity of 834,000 gallons.

Waste Water System

Sewer and wastewater service within the City of Inglewood is provided by the city and the Los Angeles County Sanitation District (LACSD). There are approximately 155 miles of sewer mains in the City of Inglewood, including 3,240 sewer manholes and 16,393 sewer lateral connections. The wastewater from the city primarily flows to the Joint Water Pollution Control Plant located in the City of Carson. The wastewater flow from the city to the LACSD treatment facility is estimated to be 10.6 million gallons per day (MGD).

Electric Power

Southern California Edison (SCE) supplies electrical energy to the City of Inglewood. SCE currently operates one (1) substation within the city, the Inglewood Substation, which provides power to the City of Inglewood through SCE infrastructure of conduits and overhead lines.

Natural Gas

Southern California Gas Company (SoCal Gas) is the supplier of natural gas to the City of Inglewood. Currently, SoCal Gas maintains transmission and distribution lines throughout the city. Most lines operate at a medium pressure of approximately 30 to 60 pounds per square inch (psi). Most Inglewood streets have SoCal Gas network pipelines running under them. The Public Utilities Commission (PUC) regulates So Cal Gas.

Oil

There is only one remaining active oil well site, the seven-acre Brea Oil Company site at Eucalyptus Avenue and Hyde Park Boulevard. This site has multiple oil wells; however, any oil or gas extracted are not stored onsite. Two major crude oil pipelines pass through western Inglewood, one 12-inch pipe and one 16-inch pipe. These pipelines transport crude oil through the city to refineries located outside of Inglewood.

Telecommunication

Local telephone service is provided by Southwestern Bell Communications (SBC—formerly Pacific Bell). Several providers, including SBC, provide long distance phone service to Inglewood and also provide internet access via DSL, cable modem, and dial-up features. City residents have a number of options for internet service, including service by Comcast, SBC and local ISPs. All major cellular phone service provider companies are licensed and monitored by the California Public Utilities Commission (CPUC). The Municipal Area Network (MAN) is a system of fiber-optic cables and electronic devices in host buildings that provide a gigabit high-speed protocol network serving few portions of the city.

3.4.5.6 Hazmat sites

Hazardous materials in the City of Inglewood are routinely used, stored, and transported in commercial and retail businesses as well as in educational facilities, hospitals, and households. Information on hazardous material use and sites was obtained from the Los Angeles County Fire Department (LACFD) and City of Inglewood General Plan update document. The following Table 3-11(a) from LACFD provides the classes of hazardous materials and corresponding quantities for the city. Tables 3-11(b) and (c) provide a list of hazardous material within liquefaction and AP fault zone.

HAZAOURDOUS MATERIAL	QUANITY	UNIT
WASTE FLAMMABLE LIQUID	605923	Gallons
AMMONIA - SPENT ETCHANT	83250	Pounds
HAZARDOUS WASTE WATER/ WASTE HALOGENATED SOLVENTS	80000	Gallons
NEW RETAIL- BATTERY FLUID ACID	72800	Pounds
HAZARDOUS WASTE WATER/ WASTE HALOGENATED SOLVENTS #38	70000	Gallons
TOXIC LIQUID	67411	Pounds
FERTILIZERS & PESTICIDES LOOSEPACK	61190	Pounds
HAZARDOUS WASTE WATER/ WASTE FLAMMABLE SOLVENTS	60000	Gallons
SPENT AMMONIA ETCH	49950	Pounds
WASTE ALKALINE	46687	Pounds
HYDROCHLORIC ACID	45244	Pounds
MIXED CHEMICALS	43408	Pounds

HAZAOURDOUS MATERIAL	QUANITY	UNIT
PETROLEUM DISTILLATES	43075	Pounds
NITRIC ACID	38881	Pounds
WASTE OIL	38700	Gallons
INKS & SOLVENTS	35880	Pounds
WASTE VARIONS ACID	35135	Pounds
AEROSOL CANS/LABPACK/LOOSE PACK	31204	Pounds
SULFURIC ACID, BATTERY ELECTROLYTE	30600	Pounds
SPENT BATTERY FLUID ACID	30000	Pounds
PHOTO CHEMICAL COMPOUNDS	26404	Pounds
CHROME PLATING SOLUTION WASTE #71	24000	Pounds
USED OIL	22002	Gallons
WASTE MOTOR OIL	21710	Gallons
NON-RCRA WASTE WATER/WASTE FLAMMABLE SOLVENTS	20000	Gallons
NON-RCRA WASTE WATER/WASTE SOLVENTS	20000	Gallons
ACETONE WASTE (SPENT)	19794	Pounds
USED LEAD ACID BATTERIES	19380.48	Pounds
VARIOUS WASTE SOLVENTS	18644	Pounds
IPA	18517	Pounds
WASTE BATTERIES	18113	Pounds
WASTE PERC (PERCHLOROETHYLENE)	17353	Pounds
OXIDIZERS (LABPACK,LOOSE PACK)	16338	Pounds
USED MOTOR OIL	15667	Gallons
MINERAL SPIRITS & SOLVENTS	15215	Pounds
MIXED ACIDS (INORGANIC/ORGANIC)	14350	Pounds
WASTE NYLON FILTERS	14000	Pounds
WASTE RAGS WITH FLAMMABLE SUBSTANCE	14000	Pounds
PETROLEUM CHEMICALS (BULK)	11050	Pounds
USED AUTOMOTIVE BATTERIES	10920	Pounds

HAZAOURDOUS MATERIAL	QUANITY	UNIT
WASTE ANTIFREEZE	9838	Pounds
BUFFERED FORMALIN	9766	Pounds
TRICHLOROETHYLENE	9441	Pounds
USED MOTOR OIL FILTERS	7465	Gallons
WASTE PAINT-RELATED MATERIALS	7027	Pounds
DEVELOPERS/FIXERS	6982	Pounds
EPOXY RESINS	6736	Pounds

Table 3-11(a) Hazardous materials and quantities reported by various facilities in Inglewood

Some of the sites with a significant potential impact on the city in case of hazmat release incidents include the Southern California Gas Company site, Marvin Engineering, the National Guard Armory, the Sanford M. Anderson Water treatment plant, the active oil well site of the Brea Oil Company, and several Leaking Underground Fuel Tanks (LUFTs) sites associated with neighborhood gasoline service stations. Some of these facilities use certain classes of hazardous materials that require accidental release scenario modeling and risk management plans to protect surrounding land uses. Section 3.5 on Vulnerability Assessment presents a summary of the chlorine gas release scenarios and dispersion analysis report for the Sanford M. Anderson water treatment plant.

FACILITY	ADDRESS
ANTHONY'S PAINT AND BODY SHOP	259 N LA BREA AVE
BUY LOW MARKET	250 N LA BREA AVE
FARRAR GRINDING CO INC	347 E BEACH AVE
FOREIGN CAR REPAIRS INC	1110 CENTINEL AVE
INGLEWOOD USD WAREHOUSE	546 N OAK ST
SUPREME PLATING CO	330 E BEACH AVE

Table 3-11(b): Hazardous materials site within liquefaction zone

FACILITY	ADDRESS
777 CLEANERS	113 E MANCHESTER BLVD
7-ELEVEN #33404	3311 W CENTURY BLVD
ANTHONY'S PAINT AND BODY SHOP	259 N LA BREA AVE
AT&T (AZ104)	301 S LA BREA AVE
BUY LOW MARKET	250 N LA BREA AVE
CALIFORNIA SUPERIOR COURT LACO	1 E REGENT ST

FACILITY	ADDRESS
J&F OIL CORPORATION #252900	9830 S CRENSHAW BLVD
JP CLEANERS	253 S LA BREA AVE
LIM'S GAS MART	145 E MANCHESTER BLVD
SPARKLING CLEANERS	320 S LA BREA AVE
WALGREENS	230 N LA BREA AVE
AUTOZONE #5395	433 N LA BREA AVE
DELGADO'S AUTOMOTIVE	300 N LA BREA AVE
EDUART GAS MART INC	1430 N LA BREA AVE
FOREIGN CAR REPAIRS INC	1110 CENTINELA AVE
HALLMARK MOTORS INC	124 W BEACH AVE
HI-TECH CLEANERS	635 N LA BREA AVE
INGLEWOOD AUTO BODY & Detail	624 N LA BREA Ave
INGLEWOOD FIELD MAINT SHOP 9	111 GROSVENOR ST
JOSE'S AUTO SERVICE	512 N LA BREA AVE
K & S AUTO REPAIR	410 N LA BREA AVE
LA BREA VALERO	1007 N LABREA AVE
RADIATOR PLUS	310 N LA BREA AVE
RALPHS GROCERY COMPANY #277	950 N LA BREA AVE
TUNEUP MASTERS #27	1211 N LA BREA AVE
WHIZZZZ CLEANERS/COIN LAUNDRY	1217 N LA BREA AVE
MOBIL SERVICE STATION #APJ	3016 W CENTURY BLVD
SWAN CLEANERS	3240 W CENTURY BLVD
CENTURY PARK CLEANERS	3201 W CENTURY BLVD

Table 3-11(c): Hazardous materials site within AP fault zone

3.4.5.7 Transportation Systems

Transportation systems include highways, roads, bridges, railroads, light rail, and airports.

Highways, Roads and Bridges

Two freeways travel through or are immediately adjacent to the City of Inglewood. These are the San Diego Freeway (Interstate 405), a north/south route in the Inglewood area, and the Glenn Anderson Freeway (Interstate 105), an east/west route along the south edge of Inglewood. In addition, there are several arterials and collector streets that make up the city's circulation system.

Caltrans maintains and operates several bridges on the highways and roads in and around the city. These bridges form the backbone of the transportation infrastructure of the City of Inglewood. Figure 3-10 shows their locations and Appendix G provides location and other attributes extracted from the National Bridge Inventory database.

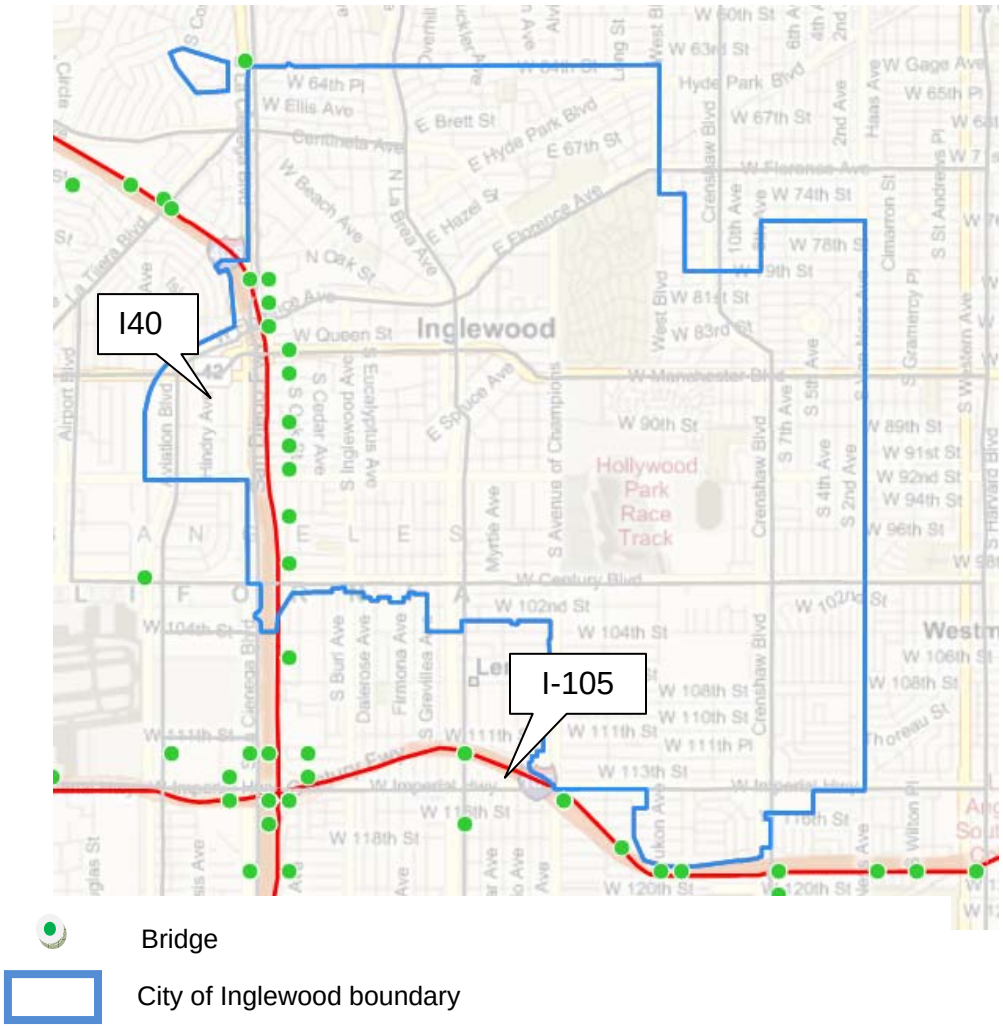


Figure 3-10: Bridges in and around the City of Inglewood extracted from the National Bridge Inventory (NBI)

Railroad

The only railroad facility in Inglewood is the former Burlington Northern & Santa Fe Railroad (BNSF) rail corridor, paralleling Florence Avenue. The right-of-way is owned by Metro for possible future use as a light rail or busway facility. It is currently utilized by oil refineries and other industrial uses located in the South Bay region.

Light Rail

Located along the median of the I-105 Freeway, the Metro Green Line is the closest rail transit facility to the City of Inglewood. The Crenshaw Boulevard/I-105 Station is the nearest station, located immediately south of the I-105 Freeway, just east of Crenshaw Boulevard.

Airports

Los Angeles International Airport (LAX), one of the busiest airports in terms of passenger and cargo movement worldwide, is located immediately to the west of the City of Inglewood and has significant impact on its land use, economy, and population.

3.5 Vulnerability Assessment

This section provides an assessment of vulnerability for the three hazards (earthquake, hazmat release, and human threat events / terrorism) that pose significant threats to the City of Inglewood. This is the final step in the four-step risk assessment process and utilizes data and information collected from the city and various external agencies. This approach is primarily based on a qualitative review of information with some quantitative analysis. It provides loss estimates and vulnerability of general buildings, key facilities with critical functions and governance relationships, and people living and working in the City of Inglewood. The vulnerability assessment provides a solid basis for analyzing the risk, the potential exposure, and consequences to city operations and safety.

3.5.1 Methodology

To conduct the vulnerability assessment, a combination of quantitative and qualitative approaches was used. A quantitative assessment of earthquake risk was performed with city provided GIS data and FEMA's HAZUS® software. For hazardous materials release and human threat events/terrorism, a more qualitative analysis was performed using expert judgment, GIS information and reports available from the city and various other public sources.

3.5.1.1 Quantitative methodology using HAZUS® for earthquake risk

For earthquake hazard, we primarily used a quantitative approach with HAZUS®. HAZUS® is a GIS-based regional loss estimation tool developed for FEMA. In addition we used BIRT (Building Inventory Replacement Tool) developed for the California Emergency Management Agency (CalEMA) by the consultant team.

Given an earthquake fault or epicenter, magnitude, and location as input, the HAZUS® earthquake module produces quantitative estimates of losses to buildings and lifeline infrastructure, estimates of impact on the functionality of facilities, and casualty and other population impacts. Alternatively, the users may import "user-supplied" hazard data, such as a ShakeMap generated by the USGS. Output from HAZUS includes several items. Losses are presented as direct economic losses from building and lifeline damage, as well as selected indirect economic losses. Functionality estimates are calculated in terms of restoration time for critical facilities, such as hospitals, highway bridges, water treatment plants, and electric power substations, and system restoration assessments for potable water and electrical power networks. Casualty estimates are provided as various levels of injury severity and death. The model also

estimates losses due to fire-following earthquake and the quantity of earthquake-related debris generated.

HAZUS® usually comes with default inventory data which allows a user to run a simplified or "Level 1" analysis without collecting additional data. However, the data is often less than optimal, which impacts the reliability of HAZUS® results. HAZUS analyses can be greatly improved with the input of various "user-supplied" data. An enhanced analysis is usually referred to as a "Level 2" analysis.

For the earthquake risk assessment for Inglewood, a Level 2 analysis was performed by updating the building square footage information from the county tax assessor files. Using BIRT (Building Inventory Replacement Tool) more accurate building square footage and count data was incorporated for the study region of analysis. Square footage per census tract is a key factor in determining losses with the HAZUS loss estimation system. Assessor data was also used to update cost estimates and the number of buildings. Also, a California Geological Survey liquefaction layer was imported into HAZUS® to characterize the local earthquake hazard.

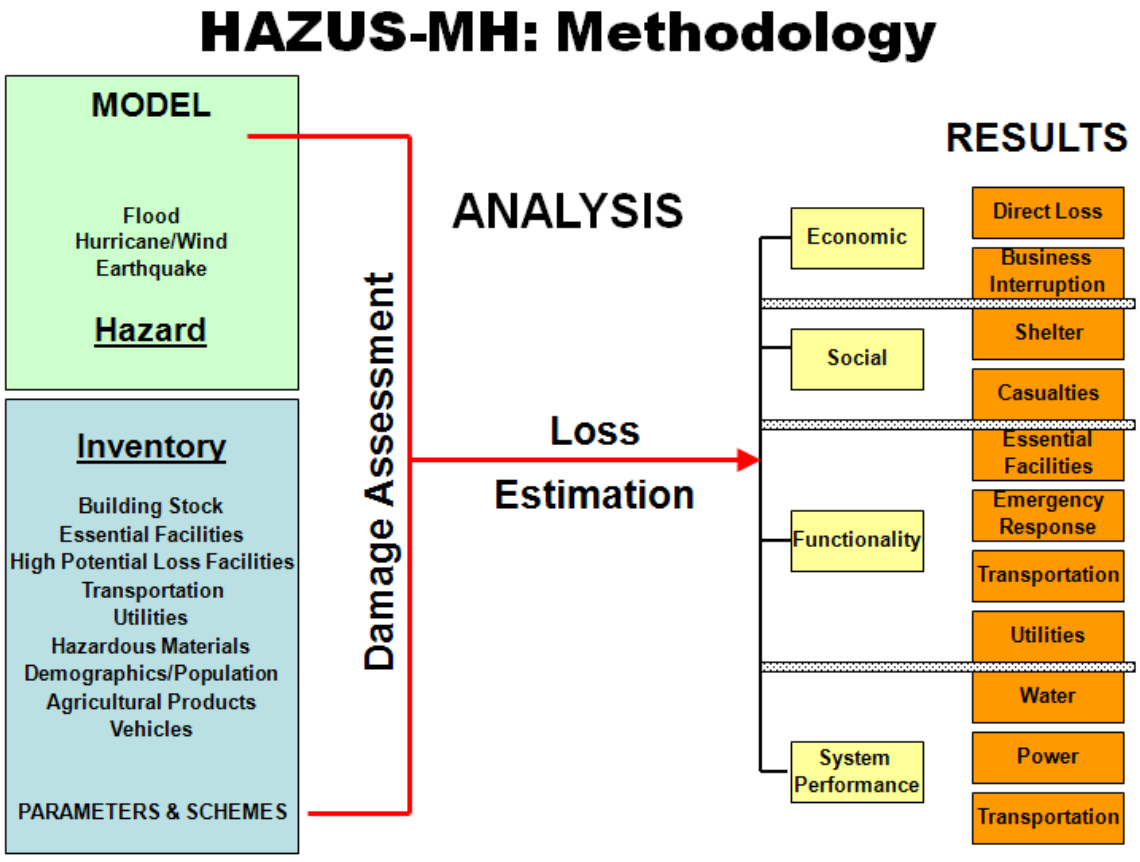


Figure 3-11: HAZUS® Multi Hazard Methodology

3.5.1.2 Qualitative methodology for hazmat release risk

For the hazmat release risk, we used a qualitative approach. GIS layers of hazmat sites were overlaid with earthquake hazard maps, namely AP fault, landslide and liquefaction, to screen the vulnerable sites. Additional data was collected from previous studies and national databases on this hazard to make an assessment of this risk.

3.5.1.3 Qualitative methodology for human threat events/ terrorism risk

In absence of access to a terrorism modeling software tool, we used a qualitative approach to analyze the potential consequences of terrorism events. This approach involved identifying potential sites, and assessing threat level, criticality and vulnerability of each site. Based on these factors a risk score was assigned to the sites to assess mitigation options.

3.5.2 M6.9 Newport Inglewood Fault Earthquake Scenario

Using HAZUS® MH MR 2, we analyzed the impacts of a 6.9 magnitude earthquake scenario on the Newport-Inglewood fault. We used a typical 475-year event planning scenario. Although not an actual event, it provides the probable magnitude and location of a hypothetical earthquake on the Newport-Inglewood fault (Figure 3-12). It is important to remember that this roughly corresponds to the 475 year event given the recurrence interval. This is a typical time horizon used for planning purposes, but the Newport Inglewood could experience a Maximum Credible Event (MCE) of magnitude 7.4.

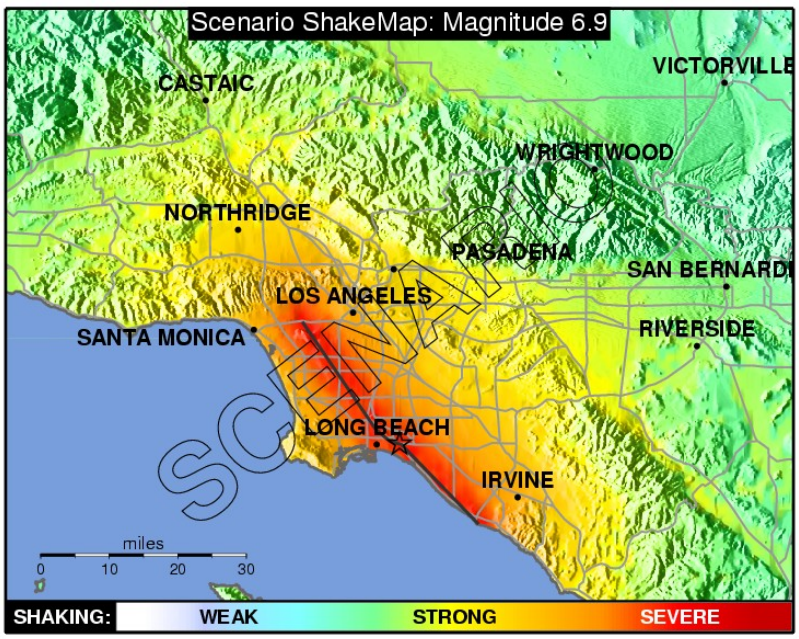


Figure 3-12: 6.9 Newport-Inglewood earthquake scenario ShakeMap

HAZUS® format GIS files of the earthquake scenario are available from the USGS scenario archive. These are peak ground acceleration (PGA), peak ground velocity (PGV) and spectral acceleration (Spectral Acceleration at 0.3 and 1.0 second) contour maps. The damage and losses are computed based on these maps. The findings of this scenario are summarized below.

A study region was created by aggregating the census tracts that fell within the Inglewood city boundary. Where the city transected the census tract boundaries, the tract was split and population distributed based on the percent area within the city. The geographical extent of the region covers about 11 square miles, consisting of 31 census tracts. There are over 42,000 households in this region, with a total population of 133,500 people (2000 Census).

The ShakeMap scenario has ground shaking of up to 0.38 g along the fault. The highest level of shaking may be experienced within a census tract in the north-east section of the city (See Figure 3-13(a) through 3-13(d)). Figures 3-13(a) through 3-13(d) are a series of figures showing the level of ground shaking mapped by census tract for peak ground acceleration (PGA), peak ground velocity (PGV) and spectral acceleration (Spectral Acceleration at 0.3 and 1.0 second)

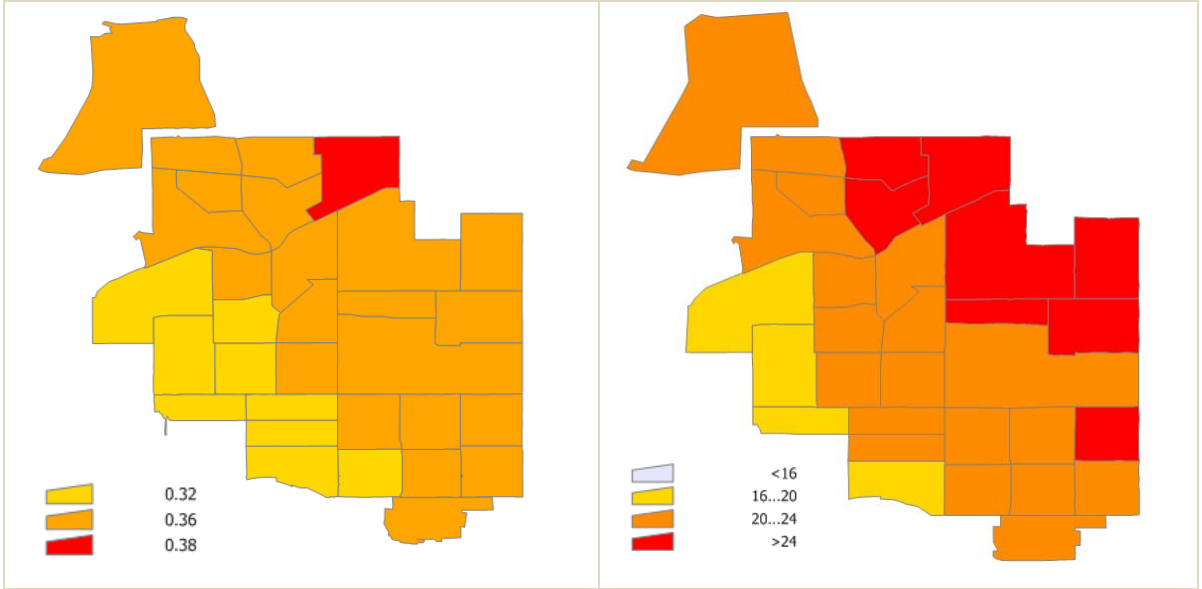


Figure 3-13(a): Peak Ground Acceleration

Figure 3-13(b): Peak Ground Velocity

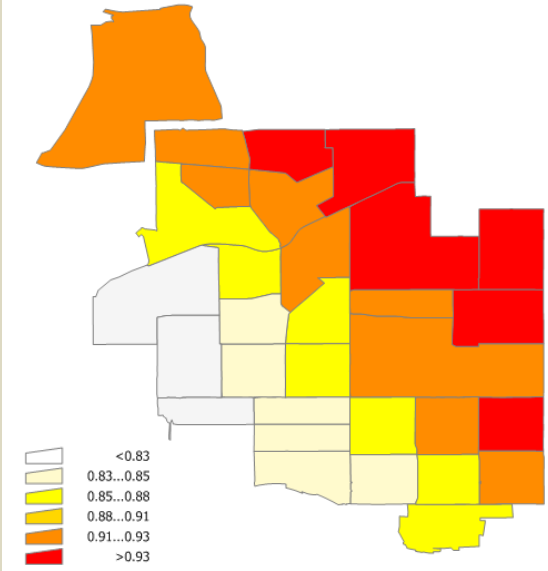


Figure 3-13(c): Spectral Acceleration at 0.3 s

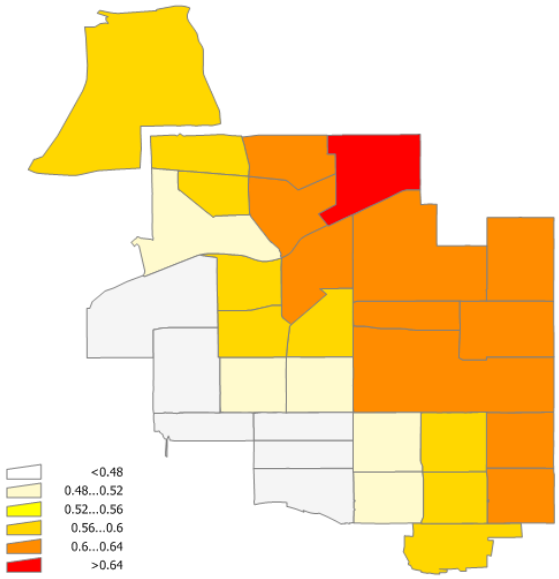


Figure 3-13(d): Spectral Acceleration at 1.0 s

Figure 3-13: Ground motion maps showing intensity by census tract for Inglewood

3.5.2.1 Building damage

HAZUS® default building inventory indicates there are about 27,000 buildings in the City of Inglewood, with a total estimated replacement value of buildings of $5.6 billion, excluding building contents. Approximately 87% of the buildings are residential, and 76% of the building value is associated with residential housing.

HAZUS® calculates structural and nonstructural damage states in terms of one of four ranges of damage or "damage states": Slight, Moderate, Extensive, and Complete. For example, the Slight damage state extends from the threshold of Slight damage up to the threshold of Moderate damage. General descriptions of these damage states are provided for all model building types with reference to observable damage incurred by structural and nonstructural building components in Appendix H. Damage predictions resulting from this physical damage estimation method are then expressed in terms of the probability of a building being in any of these four damage states.

HAZUS® estimates approximately 10,000 buildings will sustain moderate damage or higher. About 2,500 single family homes will be in or near a state of complete damage. 82% of all the structures damaged will be of wooden construction. Expected building damage by occupancy and building type is presented in Tables 3-12(a) and (b). These are based on HAZUS® default building counts. For each damage state in both tables, the percentage columns add up to 100%.

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Commercial	256	6.25	772	5.72	1,388	24.30	609	71.14	451	13.38
Government	2	0.04	3	0.02	3	0.05	1	0.14	1	0.03
Industrial	3	0.08	11	0.08	20	0.34	8	0.98	14	0.41
Other Residential	406	9.94	1,304	9.66	682	11.93	166	19.37	415	12.33
Religion	2	0.04	5	0.04	6	0.10	2	0.28	2	0.06
Single Family	3,418	83.65	11,405	84.48	3,614	63.26	69	8.08	2,485	73.78
Total	**4,086**		**13,500**		**5,713**		**856**		**3,369**	

Table 3-12(a): Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3,760	92.02	12572	93.12	3,935	68.88	62	7.23	2,769	82.21
Steel	64	1.57	245	1.82	568	9.95	260	30.38	192	5.70
Concrete	59	1.436	225	1.66	297	5.19	119	13.86	106	3.15
Precast	10	0.24	43	0.31	112	1.95	49	5.73	33	0.97
RM	188	4.59	363	2.69	576	10.09	217	25.38	180	5.35
URM	5	0.12	34	0.25	110	1.92	78	9.15	52	1.53
MH	1	0.03	19	0.14	116	2.02	71	8.28	37	1.08
Total	**4,086**		**13,500**		**5,713**		**856**		**3,369**	

Table 3-12(b): Expected Building Damage by Building Type (All Design Levels)

Note: RM- Reinforced masonry, URM- Unreinforced masonry, MH- Manufactured home

3.5.2.2 Essential facility damage

Essential facilities are critical to the functioning of the city and include hospitals, schools, emergency operations centers, and police and fire stations. Figure 3-14 shows the spatial distribution of essential facilities overlaid on a ground motion (PGA) map for the M6.9 Newport Inglewood event. According to HAZUS® estimates for the 6.9 earthquake, severity of damage states for essential facilities (includes structural and non-structural damage), in general, will be less than *moderate*, but it is important to recognize that this does not take into account fault rupture, and no additional structural information was available for these facilities. For definition of HAZUS® *damage states* for building damage (structural and non-structural), please refer to Appendix H.

According to the estimates, there will be significant loss of functionality of the hospital and police stations immediately after the earthquake. The hospital will operate at only 48% of its capacity due to damage, whereas the total functional capacity of all four police stations at day 1 following the earthquake will be 18%. This provides a very rough estimate of the anticipated consequences, given the structural information available.

3.5.2.3 Transportation and utility lifeline damage

The replacement value of facilities represented in the default data for transportation and utility lifeline systems is estimated to be $779 million and $13 million, respectively. The damage to transportation systems from this event is expected to be low or insignificant. However, critical infrastructure such as bridges and major roadways namely, interstate 405 and 105, and several other arterial roads may be impacted by an earthquake of this magnitude.

The utility system may sustain moderate damage. Given that several utility pipelines traverse the Newport-Inglewood fault, there will be several leakages and breaks in the potable water, waste water, and natural gas pipelines. More than 50% of households will be without potable water service immediately after the event, although service will be restored within 3 days. Electric power and telecommunication will sustain insignificant damage. See Tables 3-13(a) and (b) for expected damage to utility system pipeline and potable water system performance.

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	326	256	64
Waste Water	196	202	51
Natural Gas	131	216	54

Table 3-13(a): Expected Utility System Pipeline Damage (Site Specific)

	Total # of Households	Number of Households without Service	
		At Day 1	At Day 3
Potable Water	42,689	24,833	0
Electric Power		0	0

Table 3-13(b): Expected Potable Water and Electric Power System Performance

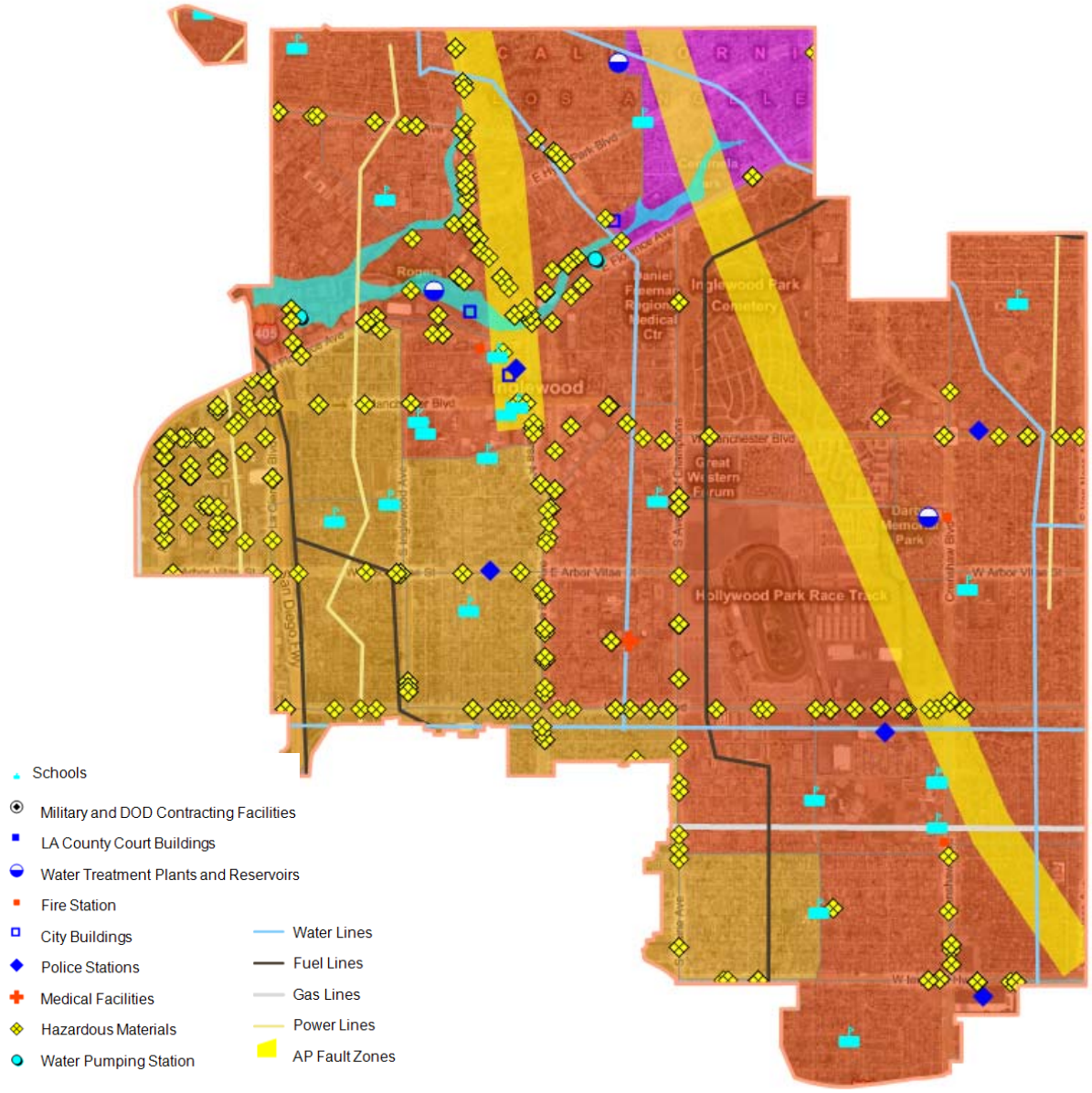


Figure 3-14: Essential facilities and lifeline systems overlaid on peak ground acceleration (by census tract) for the M6.9 Newport Inglewood scenario

3.5.2.4 Post- earthquake fire, shelter requirements, and casualties

HAZUS® estimates that there will be fire ignitions in six locations, which could burn out of control due to lack of water to fight the fires. The resulting impact of the earthquake on the utility pipelines, particularly potable water, the significant loss of functionality of the hospital, and an increased demand for services, will slow the recovery time to control post-event fires. This scenario considers default fire station information provided in HAZUS®.

HAZUS® estimates the number of households that are expected to be displaced from their homes due to the earthquake. In addition, it provides an estimated number of displaced people who will require temporary shelter. For this scenario, the model estimates about 6,500 households to be displaced and 2,100 people will require temporary shelter accommodation.

HAZUS® casualty estimates are based on the following injury classifications:

- Severity 1: Injuries requiring basic medical aid without requiring hospitalization.
- Severity 2: Injuries requiring a greater degree of medical care and hospitalization, but not expected to progress to a life-threatening status.
- Severity 3: Injuries which pose an immediate life-threatening condition if not treated adequately and expeditiously. The majority of these injuries are the result of structural collapse and subsequent entrapment or impairment of the occupants.
- Severity 4: Instantaneously killed or mortally injured.

HAZUS® estimates there will be 19 deaths due to this event (see Table 3-14). It is important to recognize, this figure may be quite low given structural information on specific high occupancy facilities. Casualty estimate maps are presented in Appendix I of this report.

Severity 1	Severity 2	Severity 3	Severity 4
628	241	35	19

Table 3-14: Casualty Estimates

3.5.2.5 Direct building related economic losses

The total economic loss estimated for the Newport-Inglewood scenario is $ 1.56 billion, which includes building and lifeline inventory losses. (See Table 3-15 below) The direct impact of the earthquake on buildings is the estimated cost of repairs and replacement of the buildings and their contents. The total building related losses are estimated to be 1.5 billion dollars. Damage to residential buildings contributed the largest amount to the total losses, making up over 67% of the total loss. Another component of the building losses is business interruption losses or losses associated with the inability to operate a business due to sustained damage. These include temporary living expenses for the people displaced from their homes because of the earthquake. 12% of the total losses are related to business interruption in the region. Table 3-15 presents the summary table of the losses associated with building damage. Maps are presented in Appendix I.

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	12.68	39.29	1.13	1.69	54.78
	Capital-Related	0.00	5.74	43.51	0.69	0.37	50.30
	Rental	9.91	52.83	17.32	1.03	1.07	82.16
	Relocation	1.09	1.09	0.83	0.15	0.26	3.42
	Subtotal	**11.00**	**72.34**	**100.95**	**2.99**	**3.39**	**190.67**
Capital Stock Loses							
	Structural	56.41	73.41	55.79	10.72	6.54	202.86
	Non-Structural	208.40	464.17	148.62	43.66	23.33	888.17
	Content	55.77	105.02	66.76	29.47	10.25	267.26
	Inventory	0.00	0.00	2.48	2.98	0.00	5.46
	Subtotal	**320.57**	**642.59**	**273.65**	**86.82**	**40.13**	**1,363.76**
	Total	**331.57**	**714.93**	**374.60**	**89.81**	**43.52**	**1,554.43**

Table 3-15: Building-Related Economic Loss Estimates (Millions of dollars)

3.5.2.5 Transportation and utility lifeline losses

For the transportation and utility lifeline systems, HAZUS® computes direct repair costs for each component. Business interruption due to lifeline outages is not included in these estimates. The most vulnerable components in the City of Inglewood's transportation and utility lifeline inventory are highway bridges, potable water and waste water distribution lines, natural gas distribution lines, and oil facilities. The total damage sustained by these components is estimated to be 6 million dollars. The major potable water and waste water distribution lines, and natural gas pipelines will sustain the most damage due to their location in relation to the Newport-Inglewood fault (see Figure 3-6 in Section 3.3.2.2 for utility map and Figure 3-10 in 3.4.5.7 for highway bridges map).

3.5.3 Hazmat Release

The risk assessment methodology implemented for assessing impacts from hazardous materials release in the City of Inglewood includes inventory development, a review of potential for release due to seismic hazard and other accidents or incidents, regional vulnerability assessment, and population risk. We have performed the vulnerability assessment quantitatively using local, regional and national level data and statistics for hazmat release incidents and accidents.

3.5.3.1 Hazmat release risk from fixed site sources

"Inventory of sites using hazardous materials was obtained from the Los Angeles County Fire Department (LACFD) and Leaking Underground Fuel Tanks (LUFTs) list from City of Inglewood General Plan Update (2006) document. Several hazardous materials sites in Inglewood are located within liquefaction and fault zones (See Tables 3-10(a) and (b) in Section 3.4.5.6). The list of LUFT sites is provided in Appendix J."

Based on two previous studies on hazardous materials release in areas of high seismic risk (Seligson et al and Eguchi et al), it is generally acknowledged that a major earthquake in an industrialized, densely populated area of the U.S. could lead to the release of hazardous chemicals. A large post-earthquake release would present a threat not only to residents in the immediate vicinity of the source, but also to those of surrounding communities. Affected areas would then face a range of emergency management problems. For example, a major earthquake is likely to seriously impair community emergency response capability, making it difficult to effectively deal with secondary emergencies such as hazardous materials releases and fires. Tasks which are normally problematic, such as warning the public about a toxic release and evacuating people from areas that are hazardous, would be much more difficult following a major earthquake. Further, communities are accustomed to responding to hazardous materials releases one at a time, while in an earthquake situation multiple accidents may occur simultaneously, greatly compounding resource problems.

Although there has never been a major incident involving hazardous materials as a result of a U.S. earthquake, smaller releases have occurred in events that were moderate in size. An example is an accident at a chlorine repackaging facility in the 1987 Whittier Narrows Earthquake, in which nearly one ton of chlorine gas was released (FEMA, 1987).

The impacts of hazardous materials release are expressed in terms of percent of population exposed. Here we present the findings from the 1996 report where three earthquake scenarios were studied (see Table 3-16). The study used data from 22 facilities using ammonia and /or chlorine within the Los Angeles County. The three earthquake scenarios that were considered in the report were:

- M7 earthquake on the Newport-Inglewood fault
- M8+ earthquake on the southern San Andreas fault – 300 kms of rupture along the Mojave, San Bernardino Mountain and Coachella Valley segments of the fault; and
- M5.9 earthquake on the Whittier-Elsinore fault – a re-creation of the 1987 Whittier Narrows earthquake.

In the M7 earthquake scenario on the Newport-Inglewood fault, as many as 133,000 people were exposed (2% of the total population in Los Angeles County) to hazardous materials released from 22 subject sites. As the population in Los Angeles County has grown (1.3 times according to US Census numbers) since the release of the Seligson et

al. (1996) study, we estimate that the total number of people that will be exposed to a hazardous materials release in a large Newport Inglewood event today would be around 173,000 in the Los Angeles County.

	County	Population Exposed	Total Population	Percent Exposed
Scenario 1: M 7.0 Newport/Inglewood Event	Los Angeles	132,509	7,477,503	1.800%
	Orange	491	1,932,709	0.030%
	Riverside	0	663,166	n/a
	San Bernardino	0	895,016	n/a
	Ventura	0	529,174	n/a
Scenario 2: M 8.3 San Andrea Event	Los Angeles	20,546	7,477,503	0.300%
	Orange	217	1,932,709	0.010%
	Riverside	0	663,166	n/a
	San Bernardino	0	895,016	n/a
	Ventura	0	529,174	n/a
Scenario 3: M 5.9 Whittier/Narrows Earthquake	Los Angeles	6,503	7,477,503	0.090%
	Orange	157	1,932,709	0.008%
	Riverside	0	663,166	n/a
	San Bernardino	0	895,016	n/a
	Ventura	0	529,174	n/a

Table 3-16: Population Exposure to Hazardous Materials by County (Seligson et al., 1996)

Note: Only hazardous materials sites in Los Angeles County were considered in the Seligson et al. (1996) study.

Results of a plume modeling for Sanford M. Anderson water treatment plant provide an estimate of the population at risk for the community in case of a hazardous chemical release. Modeling was performed for a worst case scenario and two additional scenarios. Dispersion analysis of the three scenarios considered the following factors: i.) release quantity, ii.) release rate, iii.) topology, iv.) meteorological characteristics of the site. A summary of the dispersion analysis is presented in Table 3-17. The distance to the toxic endpoint was estimated for each scenario and the number of people exposed to chlorine gas was identified (Table 3-18). Several sensitive population centers (Table 3-19) such as, schools, parks, and senior centers were identified within a 0.5 mile radius of the water treatment plant facility. These fell within the zone with the potential of being exposed to toxic chlorine gas in the event of a chemical release due to an earthquake or other incidents.

Parameter	Worst-Case	ALT-1	ALT-2
Materials Released	Chlorine	Chlorine	Chlorine
Type of Material (liquid/gas/liquid under pressure/refrigerated liquid	Liquid under pressure	Liquid under pressure	Liquid under pressure
Release Quantity (lb.)	2,000	2,000	2,000

Parameter	Worst-Case	ALT-1	ALT-2
Type of Release (liquid/gas)	Liquid	Liquid	Liquid
Release Rate to Outside Air (lb./m)	110	82.5	10
Release Time	10 minutes	Until empty	Until Empty
Release Direction	Vertical	Vertical	Horizontal
Release Temperature (°F)	77	77	77
Release Pressure(atm)	1	1	1
Height of release (ft) / (m)	0 / 0	8 / 2.4	0 / 0
Ambient Temperature (°F)	77	77	77
Ambient Pressure (atm)	1	1	1
Relative Humidity	50%	50%	50%
Stability Class	F	D	D
Wind Speed (m/s)	1.5	3.0	3.0
Surface Roughness	Urban	Urban	Urban
Averaging Time (minute)	N.A.	N.A.	N.A.
Type of gas (dense/neutrally buoyant)	Dense	Dense	Dense
Toxic Endpoint Concent. (ppm) / (mg/l)	3 / 0.0087	3 / 0.0087	3 / 0.0087
Distance to Toxic Endpoint (mile) / (km)	0.9 / 1.4	0.2 / 0.3	0.1 / 0.2

Table 3-17: Dispersion Analysis Summary

Scenario	Distance to Toxic Endpoint	Residential Population within the Circle
Worst Case Release	0.9 miles	37,940
ALT-1: Fuse plug leak inside the building	0.2 miles	583
ALT-2: Valve leak outside the building	0.1 mile	1

Table 3-18: Estimated Population Data

Population Receptor	Address	Type	Distance to Release Point
Hudnall Elementary School	331 W Olive St	School	0.4
Highland Elementary School	430 Venice Way	School	0.4
La Tijera Elementary School	1415 N La Tijera Blvd	School	0.5
Inglewood High School	231 S Grevillea Ave	School	0.4
George W. Crozier Middle School	151 N Grevillea Ave	School	0.3

Population Receptor	Address	Type	Distance to Release Point
Training Research Foundation	323 S Eucalyptus Ave	Preschool	0.4
First Lutheran Pre-School	600 W Queen St	Preschool	0.4
Village Preschool	434 S Grevilllea Ave	Preschool	0.5
Training Research Foundation	400 W Beach Ave	Daycare	0.2
Jordan Day Care	200 W Queen St	Daycare	0.2
Inglewood Avenue Preschool	215 S Inglewood Ave	Daycare	0.3
Kid's Castle Child Care Center	745 N La Brea Ave	Daycare	0.4
Sunshine Day Care Center	504 Edgewood St	Daycare	0.5
Youth & Family Center Infant	401 S Inglewood Ave	Daycare	0.5
Village Preschool	434 S Grevillea Ave	Daycare	0.5
Westchester Villa Retirement	220 W Manchester Blvd	Long Term Health	0.3
Eucalyptus Park Apartments	811 N Eucalyptus Ave	Long Term Health	0.4
Wells Guest Home	111 S Oak St	Long Term Health	0.4
Regency Towers	151 N Locust St	Long Term Health	0.5
Inglewood Meadows	1 S Locust St	Long Term Health	0.5
Rogers Park	400 W Beach Ave	Park	0.1
Inglewood Recreation Park	1 W Manchester Blvd	Park	0.3

Table 3-19: Sensitive Population Receptors within 0.5-Mile Radius

3.5.3.2 Hazmat release risk from transportation accidents

According to national level data, HAZMAT transportation has the lowest probability of death per person exposed (The national probability of accidental death during HAZMAT transportation/shipment from Hazardous Materials Incident Data, Department of Transportation, Pipeline and Hazardous Materials Safety Administration is presented in Appendix K Table 1). Although the countywide study and national statistics on accidental death due to HAZMAT transportation does not specifically identify the impact on the City of Inglewood facilities, it does underscore the significance of a hazmat release incident, which has a potential to impair city operations, cause widespread resource problems and impede recovery from a disaster.

3.5.4 Human Threat Events/ Terrorism

The methodology for assessing vulnerability and calculating risk from human threats/terrorism events is based on a US Department of Justice report (2005) and involves the following tasks; critical infrastructure and key asset inventory, criticality assessment, threat assessment, vulnerability assessment, risk calculation and counter measure identification. A qualitative approach is taken to perform this assessment due to the subjective nature of some of the tasks. Assessments as such rely on the intimate knowledge of the City of Inglewood law enforcement and other agency professionals to gauge the importance of potential targets and consequences of an attack.

Based on our review of City of Inglewood's profile, community input and discussion with ATF the following infrastructure were identified as critical assets of the community and deemed extremely important for public safety and health, national security, and retaining public confidence. As such, we analyze the threat level and vulnerability of each asset and provide some idea of consequences in case of a terrorism event.

3.5.4.1 High Density Population Targets

The Forum and the *Hollywood Park Casino* are locations that draw large crowds on a regular but not a daily basis. An essential part of the vulnerability assessment is considering the consequence of life loss or serious damage to important infrastructure systems and these are of paramount concern to law enforcement personnel. As such, these high density population locations are of extreme criticality. Although there have been no known credible threats against these particular locations, these are still considered vulnerable assets.

3.5.4.2 Lifeline Targets

Utility lifelines such as water storage tanks and water treatment plants are critical for sustaining households and businesses, but are less threatening to life safety if targeted by terrorists. There are health impacts if these are contaminated by biological agents. As such, these vulnerable assets need to be secured.

4.0 Capability Assessment

The City of Inglewood strives to protect and maintain the health, safety and welfare of the community on a day-to-day basis, and takes extra measures to reduce the impacts of natural or technological hazards. The City can use a variety of different tools, assets, and authorities to effectively prepare for, mitigate against, respond to and recover from emergencies and disasters. These include voluntary and mandatory measures; individual and community efforts; private and public actions; and preventive as well as responsive approaches. Example mitigation activities include educating citizens, enforcing building and development codes, constructing capital improvement projects, adopting plans, establishing incentive programs, and improving emergency preparedness and response.

The capabilities available to the City of Inglewood fall into the following broad categories: Agencies and People, Plans, Codes and Regulations, Programs and Mitigation Activities, and Financial Resources. Identifying and documenting these capabilities provides the basis for developing future mitigation opportunities and how they can be implemented within existing City programs.

4.1 Agencies and People

4.1.1 City of Inglewood

Department	Role in Disaster Mitigation and Management
Mayor and City Council	• Adopts polices, codes and standards and approves plans. • Comprise the Disaster Council
Civil Defense and Disaster Council	• Authorized by City Code, Chapter 2, Article 3 • Oversees the Emergency Operations Organization
City Administrator	• Director of the Civil Defense and Disaster Council
Emergency Operations Organization	• Includes all agencies of City government • Integrates City departments into a response organization

Department	Role in Disaster Mitigation and Management
Police	• Chief of Police is Assistant Director of Disaster Council • Assigned to Operations Section in EOC • Communications Section houses Communications Center and Emergency Operations Center • Administrative Services is Disaster Management Grant Coordinator • Coordinates CERT Program • Specially trained canines, enforcement units, forensics investigators, bike team, public relations, fiscal recruitment, vice and narcotics. • Maintains (2) mobile command centers • Back-up communications system, satellite communications, emergency cellular network • Mutual aid agreements
Public Works -Engineering -GIS -Traffic & Transportation -Water Works	• Provides leadership, planning, and administration of all public works programs, including engineering for capital projects; traffic control and parking operations; maintenance of municipal buildings, public streets, sanitary sewers and storm drains; water treatment and transportation; maintenance of fixed and rolling equipment; and contract administration for all major facilities • Assigned to Operations & Logistics Sections in EOC • Public Works Director is the designated Floodplain Administer • Provides earthquake tips on department webpage • Issues road related construction and excavation permits • Reviews subdivision maps • Cleans, maintains and repairs public sewer mains • Collects, maintains and provides digital mapping services • Operates and maintains traffic management center and intersection monitoring cameras, traffic signals, street closures and barricades, and emergency routes • Provides potable water for consumption and fire protection; maintains reservoirs.

Department	Role in Disaster Mitigation and Management
Residential Sound Insulation	• Responsible for the Aircraft Noise Mitigation Program which offers sound insulation at no cost to residents living in neighborhoods with a recorded Community Noise Equivalent Level (CNEL) of 65 decibels (dB) and higher.
Community Development	• The Community Development Department provides professional redevelopment services, administers the City's subsidized housing program, and offers a number of commercial and residential assistance programs. • Assigned to Planning & Operations Sections in EOC
-Redevelopment	• revitalizes blighted sections of Inglewood that have been designated as "Redevelopment Project Areas"
-Planning	• General Plan, land use regulations, environmental assessments,
-Building and Safety	• regulates construction and occupancy of all residential, commercial and industrial buildings in order to ensure life, fire and health safety • conducts post-disaster safety assessments • coordinates mitigation programs
-Housing	• manages housing assistance vouchers and rent subsidy programs, and ensures that contracted housing meets habitable standards
Information Technology & Communications	• Leads and supports the City of Inglewood in the appropriate application of existing and emerging information technologies. Proactively identifies and defines opportunities in technology that will enhance and automate operations, provides desktop technical support, systems analysis and implementation, telecommunication services and support, data center operations and support, and print shop services. • Assigned to Logistics Section in EOC
-Telecommunications Div.	• Responsible for all voice-related services for the City
Parks, Recreation & Community Services	• Maintains city parks and organizes youth, adult and senior cultural programs • Assigned to Operations & Logistics Sections in EOC • Responsible for Weed and Waste Abatement Program

Table 4-1: City Departments and Staff Involved in Disaster Management

4.1.2 Los Angeles County

Los Angeles County Fire Department

The City of Inglewood contracts with the Los Angeles County Fire Department for fire services including fire suppression, hazardous materials protection, emergency medical treatment, earthquake and fire safety planning, fire inspection and building plan review. The Los Angeles County Fire Department is designated as the Administering Agency for hazardous materials for the County. The Los Angeles County Fire Chief is designated as the Mutual Aid Region I Coordinator during major emergencies and is primarily responsible for the overall coordination and dispatch of mutual aid fire and rescue resources.

Los Angeles County Department of Health Services

Health services are provided to the City of Inglewood by the Los Angeles County Department of Health Services. The mission of the Department of Health Services (DHS) during disaster response conditions is to provide for the medical and health needs of the population of the Los Angeles County Operational Area by organizing, mobilizing, coordinating and directing public and private medical and health resources. The Director of Health Services, as the Operational Area Coordinator, is responsible for the countywide management and allocation of medical and health resources, both public and private. The Department also provides and coordinates public health services during disaster response conditions. Public health services may include preventive health services, including the control of communicable diseases, coordinating inspection of health hazards in damaged buildings, inspection of vital foodstuffs, water, drugs, and other consumables, mosquito and other vector control, and detection and identification of possible sources of contamination dangerous to the general physical and mental health of the community.[10]

4.1.3 Non-Governmental Organizations

Inglewood/Airport Area Chamber of Commerce

The Inglewood/Airport Area Chamber of Commerce's Team is made up of big business and small business people. Its roster includes representation from all sectors of the Inglewood/Airport Area business community. The Chamber of Commerce is an action agency designed to meet community or area needs. It is a voluntary organization of individuals and businesses who band together to advance the commercial, financial, industrial and civic interests of a community or area. Among other things it is a civic clearinghouse, a public relations counselor, legislative representative at the local, state and national levels of government, an information bureau, and a research and promotion medium.[11] The Chamber holds monthly meetings, special events, and publishes a monthly

newsletter. These activities provide an opportunity for emergency management outreach and education. For example, a recent newsletter included an article on appropriate ways to dispose of hazardous waste and toxic materials.

Partners for Progress

Inglewood Partners for Progress is a non-profit marketing cooperative established in 1993 by the city and its largest employers. Its mission is to enhance Inglewood's image as an exciting destination for shopping, sports and entertainment, and a world renowned center for medical services. Members include: Hollywood Park Land Company, Hollywood Park Casino, Centinela Hospital Medical Center, City of Inglewood, the Forum, Inglewood/Airport Area Chamber of Commerce, Inglewood Park Cemetery and Los Angeles World Airports.[12]

American Red Cross of Greater Los Angeles

Established on Oct. 2, 1916, the American Red Cross of Greater Los Angeles is the second largest chapter in the nation. Serving more than 36 cities and a number of unincorporated areas, covering more than 1,600 square miles, the Los Angeles Red Cross provides the following disaster related services: disaster response and disaster assistance; health and safety education; health and safety and disaster training classes. Their website provides a wealth of information related to preparing for, and responding to emergencies and disasters.[13]

Faithful Central Bible Church

The City of Inglewood partners with the Faithful Central Bible Church in several ways. The Forum, which is owned by the Church is a designated emergency shelter. The Church is also working with the City to hold an Emergency Preparedness Fair at the Forum, which will hopefully become an annual event.

Homeowners Associations

Homeowner associations can contribute significantly to reducing disaster risk. The City of Inglewood Police Department coordinates emergency preparedness activities with homeowner associations and neighborhood groups. Many homeowner associations and neighborhood block groups have participated in the CERT training and are working on developing their emergency response plans.

4.2 Plans

The City of Inglewood has numerous plans that address disaster management. These plans define important City policies and support the ordinances and activities described below. Some of them directly relate to hazard mitigation, such as the Public Safety Element of the General Plan. Others focus on different aspects of disaster management such as emergency response. Still others do

not focus directly on disaster issues but have implications that are relevant to hazard mitigation, such as plans related to spending on public facilities and storage of hazardous materials. This section reviews City plans and highlights the elements that are relevant to disaster mitigation and can support future implementation of mitigation actions identified in this plan.

4.2.1 The General Plan

All cities and counties in California are required to adopt a General Plan that lays out major policy goals. The General Plan includes elements, which are sections that address a variety of important topics. The element most closely related to this Hazard Mitigation Plan is the Safety Element, which focuses on reducing risks posed by natural and technological hazards and other human caused emergency events. Other elements also provide guidance relevant to mitigation, including the Land Use, Open Space, Conservation, Housing, Transportation, and Noise elements. For example, the Land Use Element restricts land uses and density in hazardous areas, thereby limiting the number of people and buildings exposed to hazards. The City of Inglewood is currently updating its General Plan.

4.2.2 The Public Safety Element

The aim of the Public Safety Element is to reduce the potential risk of death, injury, property damage, and economic and social dislocation resulting from fires, floods, earthquakes, landslides, and other hazards. The Safety Element identifies all significant hazards and risks in a community and defines policies to mitigate and respond to those risks. The Safety Element is currently being updated along with the City General Plan.

4.2.3 City of Inglewood Consolidated Plan[14]

The Consolidated Plan is a three-year strategic implementation plan that identifies the housing and community development needs of the City of Inglewood and allocates resources to address the needs of very low- to moderate-income residents. It outlines an implementation strategy to address those needs and permits the targeting of funds received from the U.S. Department of Housing and Urban Development (HUD), such as Community Development Block Grants (CDBG), the Home Investment Partnership Act (HOME), and Emergency Shelter Grant (ESG) funds to mitigate identified needs. HUD's program goals include: removing slum and blighted conditions, serving the needs of very low to moderate income persons; and alleviating urgent needs in federally declared disaster areas.

4.2.4 Capital Improvement Program (CIP)

The CIP outlines the annual appropriations in the City's budget for capital improvement projects such as street or park improvements, building construction, and various kinds of major facility maintenance. Capital improvement projects are supported by a three-year expenditure plan, which details funding sources and expenditure amounts. They are often multi-year projects, which require funding beyond the one-year period of the annual budget. The 2008-2009 CIP includes several seismic retrofit projects for critical city-owned structures: City Hall, Police Department, and Library.

4.2.5 Urban Water Management Plan

The Inglewood City Council adopted the 2005 update of the Urban Water Management Plan on January 10, 2006. The purpose of the document is to review current and future water resources, and to establish and maintain water conservation programs.

4.2.6 Emergency Operations Plan

The City of Inglewood produced an Emergency Response Plan to comply with the Standardized Emergency Management System (SEMS) that was developed by the State of California, and the National Incident Management System (NIMS) that was developed by the Federal Emergency Management Agency. The plan includes information on the Emergency Operations Organization (EOO), the roles and responsibilities of each section, and includes operational checklists to guide response actions.

4.2.7 Mutual Aid Agreements

Inter-jurisdictional arrangements to assure public safety, protection and other assistance services today generally are in the form of “mutual aid” agreements. Mutual aid and other agreements provide for voluntary cooperative efforts and for provision or receipt of services and aid to or from other agencies or jurisdictions when local capabilities are exceeded by an emergency event. Through mutual aid agreements, the EOO and individual City agencies coordinate emergency response planning with adjacent cities, the County of Los Angeles, the State, federal agencies and other public and private organizations, such as the School Districts and the American Red Cross. The California Emergency Management Agency (CalEMA) is designated by law to provide coordination and State resources to regions or local areas that are declared disaster areas by the Governor. The City is in Area G of the Southern Region of the state Mutual Aid emergency management areas.

4.2.8 Terrorism Response Plan

The City of Inglewood does not have a stand-alone terrorism response plan, but rather coordinates and is assigned responsibilities under the Los Angeles County and the Los Angeles International Airport Terrorism Plans.

4.2.9 Inglewood Unified School District: Comprehensive Safety Plan

The IUSD board recognizes that students and staff have the right to a safe and secure campus where they are free from physical and psychological harm. Each principal or designee is responsible for the development of a site-level safety plan, in accordance with law, tailored to the specific concerns of each school. The plans take into account the school's staff, available resources, and building design, as well as other factors unique to the site. The school safety plan is required to be reviewed and updated annually by March 1 of each year. New school campuses are required to develop a safety plan within one year of initiating operations.

4.3 Codes & Regulations

The City has adopted codes and regulations to govern development, construction and land use activities. They include construction standards, siting requirements, use limitations, study requirements and mitigation requirements which help directly or indirectly minimize the exposure of people and property to loss or injury resulting from disasters. As such, they are an effective tool and capability which the City may continue to use to reduce the amount of damage or harm arising from disasters. This plan provides an opportunity to review existing regulations to determine if they are effective or whether they need to be revised in certain areas to more adequately prevent loss or injury from disasters.

4.3.1 Zoning Regulations

Chapter 12, Article 1, Section 12-2, of the Municipal Code defines the use of land and buildings, the height, bulk, location of structures, the amount of open space and the density of population by establishing zone classifications.

4.3.2 Subdivision Regulations

The City subdivision regulations are outlined in Chapter 12, Article 22 of the Municipal Code. The ordinance establishes standards to regulate the division and merger of land, defines minimum lot sizes, densities and development standards, and regulates land use in hazardous areas.

4.3.3 Building Code

Chapter 11, Article 2 of the Municipal Code adopted the "California Building Code, 2001 Edition," Volumes 1, 2, based on the Uniform Building Code, 1997 Edition, including the following Appendix Chapters, Chapter 3A, Division I, Chapter 12, Division I, and Division IIA, Chapter 15, Chapter 18, Chapter 31, Division III, Chapter 33, Chapter 34, "Uniform Housing Code, 1997 Edition," and the "Uniform Code for the Abatement of Dangerous Buildings, 1997 Edition," promulgated and published by the International Conference of Building Officials. The City of Inglewood is scheduled to adopt the 2007 codes in the near future.

4.3.4 Earthquake Hazard Reduction in Existing Buildings

Chapter 11, Article 13, of the Municipal Code was adopted to comply with the requirements of Senate Bill 547, the Unreinforced Masonry Building Act. The purpose of the Article is to promote public safety and welfare by reducing the risk of death or injury that may result from the effects of earthquakes on unreinforced masonry bearing wall buildings constructed prior to 1934 or any unreinforced masonry building located in the City of Inglewood. Such buildings have been widely recognized for sustaining life-hazardous damage, including partial or complete collapse during moderate to strong earthquakes. This Article provides systematic procedures and standards or identification and classification of unreinforced masonry bearing wall buildings based on their present use. Priorities, time periods and standards are also established under which these buildings are required to be structurally analyzed and anchored. Where the analysis finds deficiencies, this Article requires the building to be strengthened or demolished. Qualified Historical Buildings shall comply with the State Historical Building Code (SHBC) established under Part 8, Title 4 of the California Administrative Code.

4.3.5 Los Angeles County Fire Code

Chapter 6, Article 1 of the Municipal Code adopts the Los Angeles 2000 Fire Code as the Fire Code of the City of Inglewood. Los Angeles County has adopted the 2007 Fire Code and the City of Inglewood is scheduled to adopt the updated code in the near future.

4.3.6 Hazardous Material Inventory and Emergency

Chapter 6, Article 2, Sections 6-5 of the Municipal Code designates the Fire Department of Los Angeles County as the administering agency for the implementation of the hazardous material inventory and emergency response program within the City of Inglewood. It requires the Fire Chief to enforce the provisions of the California Hazardous Materials Release Response Plans and Inventory Law; and prepare supplemental regulations from time to time to facilitate such enforcement.

4.3.7 Urban Runoff Pollution Control

Chapter 10, Article 16, Section 10-202 of the Municipal Code addresses water quality and stormwater runoff. The purpose of this Article is to protect and improve water quality of receiving waters by prohibiting illicit discharges to the municipal separate storm sewer system (MS4); detecting and eliminating illicit connections to the municipal storm water system; reducing pollutants in storm water discharges to the MS4 from sources, including but not limited to, construction sites, development and redevelopment projects, commercial establishments, industries, and any other source of storm water and non-storm water runoff pollution over which the City has control.

4.3.8 Floodplain Management Regulations

Although the City of Inglewood does not currently lie in any mapped floodplain areas as defined by the Federal Emergency Management Agency, the City has adopted floodplain management regulations in Chapter 10, Article 15 of the Municipal Code. The purpose of the article is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas.

4.3.9 Civil Defense and Disaster Regulations

Chapter 2, Article 3, Section 2-47 of the Municipal Code establishes the Emergency Operations Organization. The code defines the Civil Defense and Disaster Organization of the City as (1) all officers and employees of the City; (2) all volunteer forces enrolled to aid them during a disaster; and (3) all groups, organizations and persons who may by agreement or operation of laws be charged with duties incident to the protection of life and property in the City during such disaster. Subsequent sections of the code define the organizational duties and functions of the EOO, and the responsibilities and emergency powers of its Director.

4.4 Mitigation Projects and Programs

4.4.1 City of Inglewood Home Page

The City's Home Page Website maintains information on Emergency Preparedness and provides links to other organizations with additional information.

4.4.2 CERT

The CERT Program is designed to train residents to assist safety personnel and City staff in the event of a major disaster. Volunteers from the community are trained in first aid, light search and rescue, minor fire suppression, and other

skills that are critical in the first few hours of a disaster. The Inglewood Police Department is the City contact point for CERT training. Trainings are conducted by the Los Angeles County Fire Department.

4.4.3 Seismic Evaluation of Critical Facilities

The City of Inglewood has conducted seismic evaluations of the City Hall and the City Services Center to determine the level of seismic retrofit necessary to protect life and safety during an earthquake event. The reports recommend several areas of seismic retrofit required to meet Life Safety Building Performance Level 3-C as set forth in FEMA 386 (Pre-standard and Commentary for the Seismic Rehabilitation of Buildings). The evaluations are based on ground shaking criteria only and do not address damage that could be caused by fault rupture. Additional evaluations will address ground rupture.

4.4.4 Unreinforced Masonry Building Retrofit Program

In 1986, Senate Bill 547 was signed by the governor, requiring local jurisdictions to address the life safety risks posed by unreinforced masonry (URM) buildings that were constructed before the adoption of seismic-resistant buildings codes. Local governments were mandated to inventory the number of URMs in their jurisdiction, to notify owners regarding the expected performance of these buildings, and were urged to adopt programs to strengthen those buildings.

In response to the state mandate, the City created an inventory of 56 URM buildings that met the criteria outlined in the state legislation. The City adopted a mandatory strengthening program similar to Division 88 of the City of Los Angeles Code, and codified it by ordinance in the Municipal Code, Chapter 11, Section 11-2, Article 13. As an incentive to building owners to complete the mitigation projects, the City reimbursed up to $3,000 of the cost of engineering studies, 100% of plan check fees, permits and taxes, using redevelopment money. The 2006 report issued by the California Seismic Safety Commission on the status of the program indicates the City achieved a mitigation rate of 98%, with 51 buildings in compliance with the retrofit ordinance, 1 under construction, and 4 buildings demolished.

4.4.5 Tilt-up Retrofit Program

Although the City does not have a mandatory retrofit program for tilt-up buildings, it encourages owners to retrofit those buildings that do not meet current codes. The City estimates that 15% of the approximately 300 tilt-up buildings have been voluntarily retrofit.

4.4.6 Aircraft Noise Mitigation Program

The City of Inglewood's highly popular Residential Sound Insulation Program is making great strides in its campaign to reduce the impact of aircraft noise on

homes under the flight path of Los Angeles International Airport. This is achieved through the attainment, coordination and management of grant funds provided by the Federal Aviation Administration and Los Angeles World Airports and with these funds the implementation of the Aircraft Noise Mitigation Program.

4.4.7 Point of Dispensing Sites (POD)

In March 2008, City Council accepted Urban Area Security Initiative grant funds in the amount $30,000 for developing Point of Dispensing (POD) sites at various locations within the City. In the event of an incident that threatens public health, the sites will be opened for mass prophylaxis distribution. Five POD sites have been identified in the City: The Forum, Rogers Park, Veterans Memorial Center, Darby Park, and Morningside High School. If a site is opened, the Police Department will coordinate efforts with the L.A. County Department of Health Services. Each site is capable of distributing medication to at least 1000 people per hour.

4.5 Financial Resources

4.5.1 General Fund Sources

The City of Inglewood relies on several major revenue sources that account for approximately 90% of the General Fund budget, including: Utility User Taxes, Property Taxes, Sales Taxes, Motor Vehicle-in-Lieu Tax, Business License Tax, Vehicle Code Fines, Card Club License fees, Parking Fines, Transient Occupancy Tax, Permits and Fees, and the Pari-Mutuel Tax.[15]

Utility User Tax (UUT): Utility taxes of 10% are levied on consumption of electricity, gas, water, telephone and cable television services within the City of Inglewood.

Property Taxes: The County of Los Angeles levies a tax of 1% on the assessed valuation of property within the County. The City of Inglewood receives approximately a 14% share of this 1% levy for property located within the City limits.

Sales Taxes: The City of Inglewood receives a 1% share of all taxable sales generated within its borders. In addition to this 1% share, the City receives a portion of an additional Statewide voter-approved 1/2% sales tax amount, which is dedicated for public safety purposes.

Measure IT Sales Tax: A 2006 City of Inglewood voter approved special one-half cent use tax from sales for vital city services.

Motor Vehicle-In-Lieu Tax: The State Revenue and Taxation code imposes an annual license fee of 2% of the market value of motor vehicles in lieu of a local

motor vehicle property tax. Each city's property tax in-lieu of Vehicle License Fees (VLF Adjustment Amount) grows at the same annual rate as the city's gross assessed property.

Business License Tax: Any business that requires Permits and Licensing Committee approval must obtain a Business License. The different types of businesses are grouped by categories and each category has a separate application fee, which must be paid yearly. Annual fees range from $25.00 to $2,500, depending on the category of business. Businesses involving potential safety hazards are charged at the $50.00 rate.

Card Club License Fees: A voter-approved card club opened at Hollywood Park in July of 1994. The City receives a percentage of the revenues generated by the card club, on a monthly basis.

Parking Fines: The City of Inglewood employs special enforcement officers to ensure adherence to City parking regulations. These officers issue citations for various parking violations. These violations can be paid directly to the City, paid at DMV renewal periods, collected through liens on state income tax refunds and received as a result of court action.

Transient Occupancy Tax: Transient occupancy taxes are assessed on hotel and motel room rentals within the City of Inglewood at a rate of 14%.

Vehicle Code and Related Fines: The City instituted a program of red light camera enforcement program fiscal year 2004 at selected city intersections. This revenue is combined with other vehicle code enforcement revenues.

Pari-Mutuel Tax: The City of Inglewood receives 1/3 of 1% of all pari-mutuel wagering revenue at Hollywood Park.

4.5.2 Permits & Fees City Services

The City of Inglewood currently issues permits and collects fees for services under the procedures in the State Constitution, and the laws enacted since Proposition 13 and Proposition 168 requiring votes of the electorate on new taxes. Fees and permits under this section are not taxes, and the amount collected cannot exceed the costs of those services.

4.5.3 Capital Improvement Plan

Several seismic retrofit projects are included in the City of Inglewood 2008-2009 Capital Improvement Plan.

City Hall Renovations - Civic Center Complex: This project will provide funds to upgrade the City Hall to meet American Disabilities Act (ADA) requirements,

perform seismic retrofitting, repair and/or replace elevators, enhance security, and various other design and aesthetic improvements. The project also includes some funding for improvements and retrofitting of Parking Structure #1 and the City Service Center. (Estimated Cost: $9,581,926)

Police Department Renovations - Civic Center Complex: This project will provide funding for necessary repairs and improvements required immediately to the existing Police Facility. Improvements include jail facility renovation, creation of additional useable space in the Police Department utilizing the patio area, roof repairs, air conditioning, lighting, flooring and electrical distribution upgrades. The project also includes funding for planning and specifications for a new Police Facility. (Estimated Cost: $1,000,000)

Library Building Renovations - Civic Center Complex: This project will provide funds to upgrade the Inglewood Main Library building to meet ADA requirements, perform seismic retrofitting, repair and / or replace elevators, and various other design improvements. (Estimated Cost: $1,000,000)

4.5.4 Special Assessment Districts

A special assessment district is a compulsory levy made against certain properties to defray all or part of the cost of a specific capital improvement or service deemed to benefit primarily those properties. The City currently has several special assessment districts including: lighting, Darby-Dixon, Morningside, and In-Town.

4.5.5 Federal Funding Sources

Hazard Mitigation Grant Program (HMGP): This FEMA administered program provides grants to states and local governments following a presidential disaster declaration. The funds can be used to implement long-term hazard mitigation measures. According to the Disaster Mitigation Act of 2000, communities must have a Local Hazard Mitigation Plan (LHMP) approved to receive HMGP funds after May 1, 2005. Funds will be granted only to projects that conform to local and state mitigation plans. Federal grant funds can provide 75% of a project's total cost; other sources must provide 25% matching funds. After any federally declared disaster, up to 20% of the amount spent by FEMA on disaster response and relief costs is made available in the form of HMGP grants to communities in the affected state. The City of Inglewood applied for a grant to seismically retrofit City Hall and the Police Building under a special Statewide Program offered in 1998, however there were not enough funds in the program for these projects. The Inglewood Unified School District was awarded $1.7 million in HMGP funds following the Northridge Earthquake for the non-structural retrofit of ceilings and light fixtures.

Pre-Disaster Mitigation Program (PDM): FEMA developed the PDM program to coincide with the requirements of the Disaster Mitigation Act of 2000 that requires communities to prepare local hazard mitigation plans, such as this plan. Funds are authorized by Congress on an annual basis for PDM competitive grants, technical assistance and program support. FEMA grants can fund 75 percent of a project; other non-federal sources must provide 25 percent matching funds. Funds are only granted to communities with an approved LHMP, and supported projects must be identified in those plans. Preparation of this plan was aided by a PDM grant awarded to the City in 2007.

Community Development Block Grants: Block grants are administered by the Department of Housing and Urban Development to fund housing, economic development, public works, community facilities and public service activities serving lower income people. These funds can be used for mitigation works. CDBG funds are considered local funds once they are received, and thereby are eligible to provide the 25 percent local match required for receipt of the HMGP funds.

Assistance to Firefighter Grant Program: The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. Funds can be used to purchase equipment or fund planning, vegetation management and other preparedness activities. These grants are administered by the Office for Domestic Preparedness and the U.S. Fire Administration, both part of the Department of Homeland Security. Communities must match the federal grant with a 30 percent contribution.

Emergency Operations Center Grant: The purpose of the Emergency Operations Center (EOC) Grant is to provide funding for construction (up to $1 million) or renovation (up to $250,000) of state, local or tribal level EOCs based on identified deficiencies and needs.

Hazardous Materials Emergency Preparedness Grant: U.S. Department of Transportation HMEP Grant for the development, improvement, and implementation of hazardous material emergency plans, as well as exercises that test the emergency plans, hazards analysis, response procedures for hazardous material emergencies.

There are other federal programs that support emergency and rebuilding costs in communities, such as FEMA's Public and Individual Assistance Programs which are activated following federally declared disasters. These funds primarily support repair projects, but may also include the cost of code upgrades or other mitigation measures as part of the repair if they are cost effective.

4.5.6 State Funding Sources

The state has a variety of programs that can fund or subsidize local mitigation projects. Some important funding organizations and programs are listed below.

- CalTrans, for evaluating and strengthening local bridges
- Infrastructure State Revolving Fund, provides low-cost financing for some infrastructure projects
- Proposition 50 funds, administered by the Water Resources Control Board, for a variety of water projects
- Clean Water State Revolving Fund, low-interest loans related to water treatment

Seismic Safety New Construction Exclusions: The State Revenue and Taxation Code was amended in 2001 to provide property tax relief to property owners who undertake seismic retrofit projects. Sections 70(d) provides a15-year new construction exclusion for improvements to unreinforced masonry buildings undertaken to comply with local ordinances on seismic safety. If the property changes ownership during the 15-year period, a new base value must be established and enrolled for the entire property. Section 74.5 provides a new construction exclusion for seismic retrofitting improvements and improvements utilizing earthquake hazard mitigation technologies for existing structures other than unreinforced masonry buildings. When a property changes ownership it must be reappraised at its current full cash value.[16]

The new construction exclusion removes one of the financial disincentives for property owners to make seismic improvements to their buildings by allowing that portion of the construction or remodeling project to be exempt from a reappraisal and increase in property taxes for the specified period of time. This is critical to the successful implementation of locally mandated ordinances, where costly seismic retrofit projects will provide an increased measure of life safety, but not necessarily an increase in market value of the property.

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[10] Los Angeles County All-Hazard Mitigation Plan

[11] Inglewood Chamber of Commerce website:

http://www.inglewoodchamber.com/about_chamber.asp

[12] Partners for Progress website: http://www.inglewoodnow.com/home/index.htm

[13] American Red Cross of Greater Los Angeles website: http://redcrossla.org/howwehelp/

[14] City of Inglewood Consolidated Plan Executive Summary 2001-2004

[15] City of Inglewood 2008-2009 Annual Budget

[16] Chapter 330, Statutes of 2001, Revenue and Taxation Code section 70(d) and 74.5

5.0 Mitigation Strategies

The City of Inglewood mitigation strategy is derived from the in-depth review of the existing vulnerabilities and capabilities outlined in previous sections of this plan, combined with a vision for creating a disaster resistant and sustainable community for the future. This vision is based on informed assumptions, recognizes both mitigation challenges and opportunities, and is demonstrated by the goals and objectives outlined below. The mitigation measures identified under each objective are prioritized by the Local Planning Team and the Advisory Task Force and include an implementation plan for each measure. The measures were individually evaluated during discussions of mitigation alternatives using the elements of the STAPLEE components (Social, Technical, Administrative, Political, Legal, Economic, Environmental) and the conclusions used as input when priorities were decided (See Section 5.4 below). All priorities are based on consensus of the Local Planning Team and Advisory Task Force.

Mitigation measures are categorized generally for all hazards and specifically for the three high risk hazards facing the City that were extensively examined in the risk assessment section: earthquakes, hazmat releases, and human threat events/terrorism. Because mitigation strategies are required to include the community's involvement in the National Flood Insurance Program (NFIP), that is discussed in Section 5.6 at the end of this section.

5.1 Assumptions, Challenges and Opportunities

5.1.1 Priority Hazards

The hazard identification and risk assessment process detailed in Section 3 of this Plan clearly identifies the earthquake risk as the single natural hazard that has the most potential for causing major damage and disruption to the City of Inglewood. Although other natural hazards, including flooding, wildland fire, and landslides were considered, none were found to pose a significant risk to the community. The City does not lie in a designated flood zone as mapped by the Federal Emergency Management Agency, nor does it lie in a mapped wildland/urban interface area or a high fire hazard severity zone as mapped by the California Department of Forestry and Fire Protection. Earthquakes present both the greatest challenge and the greatest opportunity for cost effective mitigation in the City of Inglewood.

The two other hazards identified through the hazard identification screening process as high priority hazards to be addressed in this Plan are man-made hazards. Hazmat releases, particularly the potential for multiple releases that could be triggered by a seismic event, the proximity to LAX and adjacent industrial areas, and the threat of a chlorine gas release from the water treatment plant led the community to perceive hazmat release as a high priority hazard. The potential for human threat/terrorism events, in light of 9/11, and the proximity to LAX which has received credible terrorism threats in the past made this a high priority hazard for the community. Because the City

of Inglewood does not have responsibility for or ownership of facilities that pose the threat, the opportunities for City initiated mitigation measures are limited. Therefore the mitigation measures included in this Plan focus on prevention and preparedness initiatives.

5.1.2 Buildings and Infrastructure

The cornerstone of mitigation in the City of Inglewood is to ensure all construction is properly sited and built. This is best accomplished through the City's land use, zoning, and building code requirements. As outlined in the previous section, City codes for new construction are consistent with the state building code. Code upgrades triggered by remodeling and rehabilitation projects will gradually improve the existing building stock's resilience to earthquakes, landslides, and/or fires. Implicit in this plan is the assumption that the City will continue to enforce the existing policies, plans, and codes, thus limiting vulnerability of new development and redevelopment.

The greatest challenge the City faces in mitigating the impacts of future natural hazard events lies in the vulnerability of its existing public and private buildings and infrastructure to the earthquake hazard. The City Administrative Center, including City Hall, which also houses the data center and Emergency Operations Center, the Police Building, and the Public Library, are all located within the Newport-Inglewood Alquist-Priolo Fault Zone. A large magnitude earthquake on this fault (estimated between M6.0-7.4) is expected to cause major disruption of city services. The City's ability to respond to and recover from this event and/or other significant events occurring on other Southern California faults is dependent upon its facilities and personnel surviving the event. The age and construction type of City owned important buildings indicates these structures are particularly vulnerable to earthquake damage. Critical infrastructure and communication facilities also are exposed to the earthquake hazard. There is a need for a systematic technical assessment of all important City buildings and infrastructure in high hazard zones that requires outside engineering and geological expertise to identify their specific vulnerabilities and to identify cost effective mitigation solutions.

Private buildings are also vulnerable to the earthquake hazard in the City of Inglewood. The City does not currently have mandatory retrofit requirements for the most hazardous existing private buildings, such as non-ductile concrete or tilt-up buildings constructed prior to current codes. Additionally, although not posing a significant life safety threat, the age and construction of the city's single family housing stock, if not retrofit, will result in significant damage and pose serious sheltering and housing recovery issues following a major earthquake. A successful seismic retrofit program for privately owned buildings will require a strong public education program coupled with financial incentives to achieve community support.

5.1.3 Emergency Preparedness

The City of Inglewood recognizes that effective mitigation is a long-term and incremental process. Therefore, it also must focus on those measures that improve the community's ability to prepare for, respond to and recover from its most serious hazards which have been defined as earthquakes, hazmat releases, and human threat events/terrorism. To do this, the City of Inglewood must improve its emergency response capabilities, including developing a more robust and integrated emergency management organization, an operational, safe, and secure emergency operations center, improved warning and communications systems (internal and external), a comprehensive training program for city staff, and increased public information and education programs targeted to preparedness and mitigation for all-hazards.

5.1.4 Implementation Challenges

Finally, it must be recognized that increasing the disaster resiliency and sustainability of the City of Inglewood will require a substantial investment of resources. Improvements can continue to be made through traditional programs; however many of the mitigation objectives and actions included in this plan cannot be implemented without external funding sources. Implicit in this plan is the need for the City to maintain and augment internal budgeting mechanisms, aggressively pursue external state and federal grants, and develop financial incentives to encourage private sector support of mitigation activities.

5.2 The Research, Review, and Prioritization Process

During the development of the risk assessment for the City of Inglewood, the Local Planning Team and the Advisory Task Force proposed and discussed alternative mitigation goals, objectives, and specific mitigation measures that the City should undertake to reduce the risk from the three high risk hazards facing the City. Throughout the discussions, the participants focused on the mitigation aspects recommended by FEMA in STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, Environmental) to arrive at their opinions. Stakeholders discussed alternative mitigation strategies and mitigation measures during workshops, provided their preferences, and also suggested additional mitigation measures that the City should consider. National literature and sources were researched by the consultant to identify best practices measures for each hazard considered by the City. These measures were discussed with the Local Planning Team and the Advisory Task Force. The Local Planning Team, with concurrence from the Advisory Task Force, reviewed the list of possible objectives and mitigation measures, made a final selection, and then prioritized the individual mitigation measures considered the most appropriate for Inglewood.

5.3 Mitigation Categories

For purposes of this Plan, the measures that communities and citizens can consider to protect themselves, or to mitigate the impacts of, natural and man-made hazards fall

into four categories: Public Information and Education, Preventive Activities, Structural and Property Protection Projects, and Emergency Services.

5.3.1 Public Information and Education

A public information and education program involves both the public and private sectors. Public information and education activities advise and educate citizens, property owners, renters, businesses, and local officials about hazards and ways to protect people and property from them. Public information activities are among the least expensive mitigation measures and often among the most effective things a community can do to save lives and protect property.

In evaluating various mitigation measures, the Planning Team and Advisory Task Force, as well as stakeholder groups identified public information and education as a critical and cost effective method for communicating and implementing community mitigation actions. Therefore this type of mitigation measure is incorporated into the mitigation objectives and mitigation measures included in the all hazards, earthquake, hazmat release and human threat events/terrorism presented in Sections 5.5.1, 5.5.2, 5.5.3, and 5.5.4 below.

5.3.2 Preventive Activities

Preventive measures are designed to keep certain conditions from occurring or getting worse. The objective is to ensure that new development does not make an existing hazard worse or increase the potential for property damage or loss of life. Preventive measures typically include planning, zoning, and building codes, which affect both public and privately owned buildings.

Primarily regulatory in nature, mitigation measures were identified by the Planning Team and Advisory Task Force to address the earthquake and hazmat release hazards in Sections 5.5.2 and 5.5.3 below.

5.3.3 Structural and Property Protection Projects

Structural and property protection projects are typically designed by engineers and architects, constructed by the public sector, and maintained and managed by governmental entities. Structural projects include the construction of new public buildings or the retrofit of existing public buildings to provide greater public safety and greater protection to maintain government services and functions.

In evaluating mitigation measures to be included in the plan, the Planning Team and Advisory Task Force proposed structural and property protection actions for earthquake and hazmat release hazards, which are found in Sections 5.5.2 and 5.5.3.

5.3.4 Emergency Services

Emergency services measures protect people during and after a hazard event. Locally, these include preparedness, threat recognition, warning, response, critical facilities protection, and post-disaster recovery and mitigation.

Because of the commitment to community safety the Planning Team and Advisory Task Force deemed Emergency Services and Preparedness measures to be a critical element of this mitigation plan. The desire for a comprehensive emergency management capability which includes preparedness, mitigation, response and recovery stimulated the inclusion of multiple measures from this category for all the hazards, earthquake, hazmat release and human threat events/terrorism portions outlined in Sections 5.5.1, 5.5.2, 5.5.3, and 5.5.4.

5.4 Mitigation Priorities

Multiple factors were considered to establish the mitigation priorities included in this plan. Highest priority rankings were assigned to those mitigation measures that met three primary criteria: 1) greatest potential for protecting life and property; 2) greatest potential for maintaining critical city functions and operability following a disaster; and 3) achievability in terms of community support, and cost effectiveness. All rankings were determined by the consensus of the Local Planning Team and the Advisory Task Force.

As described in the previous section on hazard and risk assessment, clearly earthquakes have the potential to affect the largest number of people, critical facilities, and buildings and to cause the greatest economic losses. This fact combined with the relatively high probability of an earthquake occurrence in the next several decades makes increasing disaster resistance and readiness to earthquakes a high priority.

Given the extreme importance of maintaining critical government functions in times of disaster and the large number of the population who depend and rely on government services and infrastructure, those mitigation measures that improve government disaster resistance, readiness, or recovery capacity are generally given higher priority than mitigation of privately owned buildings in which the loss or damage affects relatively few.

Earthquake, hazmat releases, and human threat events/terrorism mitigation actions are identified and assigned a priority according to their importance, cost, funding availability, to what degree project planning has been completed, and the anticipated time to implement the measures. Implementation times are either short-term (less than two years) or long-term (more than two years). These times were selected by the City to accommodate the expected six months that the Deputy City Administrator/CIO and newly created Emergency Preparedness Coordinator will need to ramp up the emergency management capabilities of the City.

Using the above rationale for establishing mitigation priorities, each mitigation measure is assigned a priority ranking as follows:

- **Critical** – Most important actions to be implemented by the City; may be short-term or long-term
- **High** – To be implemented by the City in the short-term future
- **Moderate** – To be implemented when funding and resources become available
- **Under Study** – Under consideration pending completion of formal assessment/study

5.5 Goals, Objectives, and Mitigation Measures

The City of Inglewood Local Planning Team and Advisory Task Force with the assistance of the Consultant Team have established four overall mitigation goals to guide the establishment and priorities of specific goals, objectives, and mitigation measures for each high risk hazard. These are:

- Minimize loss of life and property from natural hazard events
- Protect public health and safety
- Increase public awareness of risk from natural hazards
- Enhance emergency services including warning systems

When the City established its list of mitigation measures, some were determined to be applicable to two or more hazards. These are listed first under the category of "All Hazards", which includes four goals. Five goals were identified for earthquake hazards, and one each for hazardous materials and human threat/terrorism events. At the end of this section, a summary table of all the mitigation measures is provided, including the priority ranking and proposed implementation strategy.

5.5.1 All Hazards

The Local Planning Team and Advisory Task Force identified four goals that would address two or more of the priority hazards:

Goal 1: Increase the emergency management capability of the City of Inglewood
Goal 2: Improve safety in public buildings from all natural and man-made hazards
Goal 3: Increase public awareness of risks from all natural and man-made hazards
Goal 4: Improve coordination and communication with relevant community organizations.

The rationale for including each of these goals in the mitigation plan and specific objectives and mitigation measures to achieve each goal is outlined below.

Goal 1: Increase the emergency management capability of the City of Inglewood

Rationale: An effective Emergency Management Program requires a strong institutional framework to ensure adequate planning, organizational structure, and resources are allocated to all phases of disaster management. Responsibility for Emergency Management in the City of Inglewood lies primarily with the Police Department. Although the City has an Emergency Response Plan consistent with SEMS and NIMS requirements, no city departmental staff are assigned on a full time basis to direct and coordinate a comprehensive emergency management program that includes preparedness, mitigation, response and recovery for all hazards.

Actions: The City of Inglewood has recently tasked the Deputy City Administration/CIO with the responsibility for Emergency Preparedness and Disaster Planning. Subject to the approval of the City Council, within 6 months, the job of Emergency Preparedness Coordinator reporting to the Deputy City Administrator/ CIO will be created and staffed. Within one year, these two people and the Police Department Commander for emergency response will reactivate the Disaster Council and develop a schedule of appropriate training programs comprised of four related subject areas:

1. Emergency related technical skills, i.e., NIMS, SIMS
2. Internal health and safety of employees
3. First responder skills
4. Oversight management

The City of Inglewood currently does not have an operational EOC. Within 9 months, the Deputy City Administrator/CIO will complete an investigation to explore options and visit newly installed EOCs in similarly sized cities to establish options. Within one year, he will evaluate the alternatives and make a recommendation to the City Council.

- Objective 1.1 - Create the institutional framework to provide critical emergency management capability.
    - Mitigation Measure 1.1.1 - Reactivate the Disaster Council (Priority = Critical)
    - Mitigation Measure 1.1.2 - Continue the Advisory Task Force as a Council Board (Priority = Critical)
    - Mitigation Measure 1.1.3 - Create a position for a full-time, fully funded Emergency Preparedness Coordinator in Public Safety Systems Section of IT&C (Priority = Critical)
    - Mitigation Measure 1.1.4 - Initiate and maintain comprehensive training programs for city personnel for ICS, etc, for both safety and non-safety personnel. (Priority = Critical)
    - Mitigation Measure 1.1.5 - Create a functional Emergency Operations Center (EOC) (Priority = Critical)

Goal 2: Improve safety in public buildings from all natural and man-made disasters

Rationale: Discussions at Local Planning Team and Advisory Task Force meetings indicated that internal warning systems, including fire alarms, at City Hall and other

public buildings do not reach all inhabitants of the buildings and need to be upgraded. The City is committed to the safety of all those who work at or are visiting these buildings and the Deputy City Administrator/CIO and Emergency Preparedness Coordinator will be responsible for the design and adoption of improvements to all warning systems and evacuation plans.

Actions: The Deputy City Administrator/CIO and the Public Works Department will conduct evaluations of buffer zones and evacuation plans of public facilities. Within one year, they will propose and implement improvements to warning systems and evacuation plans.

- Objective 2.1 – Upgrade warning systems in public buildings
  - Mitigation Measure 2.1.1 – Conduct an evaluation of the existing warning system in City Hall to determine its efficacy in reaching all people within the building in the event of a hazmat release or potential terrorism event (Priority = Critical)
- Objective 2.2 – Upgrade evacuation plans in public buildings
  - Mitigation Measure 2.2.1 – Assess evacuation plans for City Hall to consider the conditions under which evacuation will take place or when the building will be secured with everyone remaining inside (Priority = High)
  - Mitigation Measure 2.2.2 - Evaluate Buffer Zone or Evacuation Plans for public facilities and critical facilities (i.e. Water Treatment Plant) (Priority = High)
- Objective 2.3 - Upgrade existing general public notification systems
  - Mitigation Measure 2.3.1 - Develop and sustain a reliable mass notification system (Priority = Moderate)

Goal 3: Increase public awareness of risks from all natural and man-made disasters

Rationale: The City currently includes a small section on its website that is devoted to earthquake preparedness. It is the only public education mechanism used by the City to inform residents about potential disasters and what to do to mitigate them.

Actions: The Deputy City Administrator/CIO is currently managing the development of an expanded City website which will increase the amount of hazard mitigation information made available to the public. Within one year, the new website will be created and put on line. Information will be presented in both English and Spanish. Also within one year, the Deputy City Administrator/CIO and Emergency Preparedness Coordinator will investigate whether the City should join the Southern California Earthquake Center (SCEC) as a partner (See Mitigation Measure 6.1.1 below). As a partner, the City will be able to draw on the resources of SCEC, which permits the distribution of SCEC brochures describing the earthquake risk and what to do before an earthquake and also training programs for public officials. Finally, the City will Co-sponsor an initial Emergency Preparedness Fair and, following the event, evaluate whether to make this an annual event.

- Objective 3.1 – Upgrade the City website concerning hazard risks facing the City
  - Mitigation Measure 3.1.1 – Create a website that includes detailed information and links to existing preparedness and mitigation resources addressing earthquake, hazmat release, and terrorism risks (Priority = High)
  - Mitigation Measure 3.1.2 – Provide information in both English and Spanish (Priority = High)
- Objective 3.2 - Improve and expand public education programs
  - Mitigation Measure 3.2.1 – Develop a program to create and distribute written materials to educate the public about hazard risks facing the City (Priority = Moderate)
  - Mitigation Measure 3.2.2 - Sponsor an annual Emergency Preparedness Fair (Priority = Moderate)

Goal 4: Improve coordination and communication with relevant community organizations

Rationale: At all the stakeholder workshops, citizens recommended that the City establish long-term relationships among the business community, the health community, and emergency preparedness community. The first choice is to retain the Advisory Task Force as a Council Board. This assignment will satisfy Goals 1.1.2 and 1.1.3. The current capacity of the City to mitigate earthquake risk is limited and will be enhanced by expanding its partnerships with the Chamber of Commerce, local health clinics, CERT groups, and Partners for Progress. Representative of these groups all expressed interest in continuing to work with the City, to broaden such relationships.

Actions: The Deputy City Administrator/CIO and the Emergency Preparedness Coordinator will establish a set of alternative means of cooperation with community groups, determine and institute a method to evaluate these options with community groups and City Council, and make recommendations to the City Council to implement formal partnerships. The tasks will be completed within four years.

- Objective 4.1 – Establish and maintain lasting partnerships
  - Mitigation Measure 4.1.1 – Retain the Advisory Task Force as a permanent City fixture (Priority = Moderate)
  - Mitigation Measure 4.1.2 – Enhance relationships with the local Chamber of Commerce, Partners for Progress, and local health clinics (Priority = Moderate)

5.5.2 Earthquake

The earthquake hazard was emphasized throughout the planning process as the highest priority hazard, and the only natural hazard of concern to the City of Inglewood. The next five goals are designed to ensure the City can effectively respond to and recover from a major earthquake event while simultaneously working on the long-term effort to mitigate the earthquake risk.

Goal 5: Continuity of government operations
Goal 6: Land use planning and building codes
Goal 7: Earthquake resistance and readiness of critical facilities
Goal 8: Earthquake resistance of privately-owned buildings in the City
Goal 9: Public awareness

The rationale for including each of these goals in the mitigation plan and specific objectives and mitigation measures to achieve each goal and the actions to achieve these goals are discussed below.

Goal 5: Continuity of government operations

Rationale: The City currently has not completed a Continuity of Operations Plan. The Local Planning Team realized that the City cannot complete benefit cost evaluations until it understands the impact an earthquake will have on City operations.

Actions: In the next fiscal year, beginning October 1, 2009, the Deputy City Administrator/CIO will award the development of a Continuity of Operations Plan to an outside consultant that will include a Business Impact Analysis related to scenario earthquakes and other high risk hazards facing the City. The final plan will include benefit cost analyses to evaluate options open to the City to address and mitigate risks facing critical facilities. The final plan will be completed within nine months of the award.

Rationale: The Deputy City Administrator/CIO and Police officials mentioned that many of the City's current operations, including its data center and EOC, are inadequate to meet City needs, have outdated components, and are located in buildings with high earthquake risk. There currently is an ongoing Information Systems effort to upgrade the outdated computer programs but no steps have been taken to ultimately establish new EOC and data center facilities in more secure locations.

Actions: Before the Continuity of Operations Plan has been completed, the Deputy City Administrator/CIO will prepare short-term plans and then make recommendations to the City Council to establish back-up computer systems and locate a temporary EOC. This action will move critical facilities from risky buildings. Following the completion of the Continuity of Operations Plan, The Deputy City Administrator/CIO will initiate an investigation into cost beneficial alternatives to permanently relocate the EOC and back-up computer systems. Because the new location may be the new Police Building, the long-term implementation of the investigation will be completed within five years. Most of the funding will come from annual City budgets.

- Objective 5.1 – Assess the City's ability to function after a major earthquake
  - Mitigation Measure 5.1.1 – Develop a relocation plan or find an alternative facility for the Emergency Operations Center (EOC) (Priority = Critical)
  - Mitigation Measure 5.1.2 – Develop a relocation plan or find an alternative facility for the City's data center (Priority = Critical)

- Mitigation Measure 5.1.3 – Conduct a study to find a location outside the City to establish a back-up to the City computer system (Priority = Critical)
- Mitigation Measure 5.1.4 – Complete the program to remove the outdated computer aided dispatch (CAD) system from an obsolete main frame computer (Priority = Critical)

Goal 6: Land use, zoning and building codes

Rationale: Although the City of Inglewood is highly urban and built-out, there will continue to be opportunities for limited parcel development or redevelopment as well as modifications to existing structures that may trigger code upgrades. These circumstances will provide the opportunity to decrease the vulnerability of older buildings through seismic upgrades or to replace older, non-seismically resistant structures with new buildings that have been constructed to current code.

Action: The Building and Planning Department will continue to review all permit applications for new development and substantial improvements to ensure they are consistent with current codes and ordinances and are sited to minimize exposure to geologic hazards. All proposed redevelopment projects will be reviewed to ensure they are constructed to current code and are not constructed across active traces of the Newport-Inglewood Fault. This is an ongoing responsibility of the Building and Planning Department.

- Objective 6.1 – Update and enforce City codes to minimize the risks of earthquake hazards.
  - Mitigation Measure 6.1.1 – Ensure all new development and redevelopment is sited and constructed in accordance with the General Plan and zoning ordinances. (Priority = High)
  - Mitigation Measure 6.1.2 - Adopt, upon approval by the International Code Council (ICC) and the State of California, revisions to the California Building Code which increase seismic resistance of structures to ground shaking and other geologic hazards. (Priority = High)

Goal 7: Earthquake resistance and readiness of critical facilities

Rationale: Inglewood's civic operations are dependent on the continuing functioning of City Hall. The City currently has plans to retrofit the City Hall, however, the existing structural analysis and recommended retrofit plans address the ground shaking hazard only. As yet, no geotechnical study has been done to determine whether or not the structure is located on the Newport-Inglewood Fault. If the building is on the fault, the ground beneath the building may move and affect the building in ways not considered in current structural evaluations. A complete assessment of the risk is required before the City can embark on the retrofit project.

Actions: Within one year, the Public Works Department will engage a geology engineering firm to perform a geotechnical study of City Hall to determine its earthquake

risk. Within one year following the completion of the geotechnical study, the Public Works Department will complete its plans to either retrofit City Hall or to start an investigation to find a less risky location for a new City Hall. The Public Works Department and the Deputy City Administrator/CIO will seek outside funds if the costs exceed City budgetary constraints.

Rationale: Inglewood's drinking water is dependent on its water treatment plant and reservoirs. There has never been a seismic study of these facilities to withstand major earthquakes.

Actions: The Public Works Department will conduct a seismic evaluation of the water treatment plant within one year and a seismic evaluation of the reservoirs within three years. Funding will come from the department budget.

Rationale: The City currently has plans to construct a new Police Building. The City Council has authorized the process of indentifying a new site and it is currently in progress. The Police Department has identified several sites that meet the size requirements for the proposed facility and has completed a preliminary evaluation based on proximity to the Newport-Inglewood fault zone. However, additional geotechnical investigations will be required prior to site design and construction. Once constructed, the building will be considered as a new location for the EOC and other critical government facilities.

The City Planning Team and the Advisory Task Force both agreed that the relocation of the Police Building and the updating of the computer aided dispatch system were the top priorities of the City as the police are the most important post-disaster City agency to maintain order, protect lives and property, and coordinate the City response. Public safety is dependent on the police.

Actions: The Police Department will complete its study within one year, permitting the initiation of a process to design and construct the new Police Building. Most of the funding for the study and construction will come from the Police budget. The Police Department Grants Administrator will however locate funding sources and apply for funding to partially pay for the design and construction of the new building. That activity will be completed within three years. Because a significant amount of the funding may come from the City budget, the completion of this project may delay other critical and high priority mitigation items.

Rationale: The City Planning Team and the Advisory Task Force both support the establishment of a program to evaluate non-structural elements in critical public buildings and then incorporate relevant risk reduction measures to reduce future losses and increase the probability these buildings will remain functional following a major earthquake. Two priority areas for initial non-structural retrofit include bracing of library shelves in the main library and bracing/bolting of critical information technology equipment and backup power sources.

Actions: The Deputy City Administrator/CIO will create a Request for Proposal to hire an outside engineering firm to conduct the investigation. He will also seek outside funding. Upon receipt of outside funding, the RFP will be issued and the study undertaken. The process will take one year following the receipt of outside funding.

- Objective 7.1 – Conduct seismic studies of critical facilities
  - Mitigation Measure 7.1.1 – Conduct a geotechnical study to determine if the City Hall lies on the Newport-Inglewood fault. If so, develop and implement a seismic retrofit solution or seek to relocate critical functions. (Priority = Critical)
  - Mitigation Measure 7.1.2 – Conduct a risk assessment of the City's water treatment plant and City reservoirs. Following the risk assessment, seek funding and implement the highest priority recommendations. (Priority = Critical)
  - Mitigation Measure 7.1.3 – Identify and acquire an acceptable site for the relocation of the Police Building out of the Newport-Inglewood fault zone. Ensure new construction meets essential services building requirements (Priority = Critical)
  - Mitigation Measure 7.1.4 – Establish a non-structural hazard evaluation and risk reduction program for city buildings and departments housing critical functions. (Priority = Critical)
  - Mitigation Measure 7.1.5 - Install seismic bracing on all critical IT equipment and back-up power sources. (Priority = High)
  - Mitigation Measure 7.1.6 - Install seismic bracing bars on main branch library shelves to prevent collapse and public injury. (Priority = High)

Goal 8: Earthquake resistance of privately-owned buildings in the City

Rationale: The City has a significant but unknown number of apartment buildings with soft first stories and industrial zones with a large number of tilt-up buildings constructed before 1972 used for commercial warehousing and shipping. The building inspection department in Building and Planning estimates that there are approximately 300 tilt-up buildings within the city limits and all of them should be retrofit. When buildings are sold, the building inspection department has encouraged buyers to retrofit them before occupying them. The department estimates that 15% of the tilt-up buildings have been voluntarily retrofit due to their recommendations.

Actions: Building and Planning will conduct a study to determine the number and location of apartment buildings with soft first stories and a second study to determine the number and location of tilt-up buildings to understand the scope of the earthquake risk to these buildings in the City. Part of the study will be an investigation of whether the City should adopt ordinances requiring retrofit of these buildings. Within one year, the department will determine the timing of the studies and how they will be conducted and paid for.

The building inspection department will continue to encourage buyers of tilt-up buildings to voluntarily retrofit their newly acquired buildings. The goal will be to have 30% of the stock of tilt-up buildings retrofit within five years.

Building and Planning will conduct an internal study that assesses earthquake risk in high occupancy buildings and how the City might encourage the voluntary retrofit of single family residences. The study will be completed within five years. Building and Planning will also complete studies determining whether the City should adopt ordinances requiring retrofit of these buildings. Because the social and economic impacts are large, the Local Planning Team and Advisory Task Force assessed these studies as medium priorities.

Rationale: In recent years, the City lost one of its two major hospitals, Daniel Freeman. Currently, the privately-owned Centinela Hospital is the only large, full-service hospital in the city. Citizens in the City will be dependent on the hospital following a large earthquake, and the City considers its functioning to be critical for public safety and recovery.

Actions: The Deputy City Administrator/CIO will investigate what the City may do to support efforts of Centinela Hospital to retrofit elements of the hospital that have not heretofore been retrofit. The investigation will involve hospital administrators and will be completed within three years. Results of the investigation will be presented to the City Council.

- Objective 8.1 – Conduct inventories
  - Mitigation Measure 8.1.1 - Establish a methodology for developing a soft story building inventory. (Priority = Under Study)
  - Mitigation Measure 8.1.2 – Inventory privately owned soft story buildings in the City and notify owners of the potential vulnerability and techniques for seismic retrofit. (Priority = Under Study)
  - Mitigation Measure 8.1.3 – Inventory privately-owned tilt-up buildings in the City and notify owners of their potential vulnerability and techniques for seismic retrofit. (Priority = Under Study)
- Objective 8.2 – Support seismic risk assessment and retrofit of privately-owned buildings
  - Mitigation Measure 8.2.1 – Support efforts to seismically retrofit Centinela Hospital to meet the requirements of SB 1953 (Alfred E. Alquist Hospital Seismic Safety Act of 1983) (Priority = Critical)
  - Mitigation Measure 8.2.2 - Consider developing a tilt-up retrofit ordinance to encourage retrofit of privately-owned tilt-up buildings (Priority = Under Study)
  - Mitigation Measure 8.2.3 – Conduct a risk assessment of high occupancy buildings and all buildings currently listed as potential post-disaster shelters (Priority = Under Study)
  - Mitigation Measure 8.2.4 - Encourage retrofit of single family homes including bolting to foundations, strengthening cripple walls, and removing or

strengthening masonry chimneys. Seek financial incentives, including state or federal grant programs. (Priority = Under Study)

Goal 9: Public awareness

Rationale: Information provided to the public by the City concerning earthquake risk and mitigation is limited to a short web page on the City's website.

Actions: Information Systems (IS) will upgrade the website within one year. Within three years, IS will investigate and determine what written material to assemble and distribute to the public. One possibility is to become a partner of SCEC so city employees may take part in training exercises and the City may distribute earthquake brochures developed by SCEC.

- Objective 9.1: Increase education and training of public employees
  - Mitigation Measure 8.1.1 - Join the Southern California Earthquake Center (SCEC) (Priority = Under Study)
- Objective 9.2 – Increase citizens' awareness and knowledge of earthquake risk and mitigation
  - Mitigation Measure 8.2.1 – Develop and distribute information to citizens (Priority = Moderate)

5.5.3 Hazmat Releases

Prevention of hazmat releases was selected by the Local Planning Team and the Advisory Task Force as the most effective means of mitigation, which is reflected in the goal, rationale, actions and mitigation measures outlined below.

Goal 10: Preventive measures

Rationale: The main hazmat release threat was identified as a chlorine gas spill that would likely occur in the industrial area near the airport on the east side of I-405. The threat comes from privately owned businesses. There could also be a spill at the City water treatment plant but it was considered less likely.

Actions: The main means of dealing with such an event are to first educate the populace about such an event and what to do if they are located inside or outside the area of the potential plume that will move into the City if normal westerly winds are present. The Deputy City Administrator/CIO will consult with the Los Angeles County Fire Department, which is contracted to provide fire protection in the City, to establish a program dealing with hazmat releases. Within three years, an education program will be developed.

The Deputy City Administrator/CIO, with the advice of the Los Angeles County Fire Department, will develop a plan to encourage companies using chlorine gas to install measures that prevent the release of chlorine gas from their buildings. In addition, they

will encourage owners of commercial buildings located in the potential chlorine gas release plume to install air circulation systems that re-circulate inside air and prevent outside air from entering their premises These plans will be completed within three years.

- Objective 10.1 – Develop public education program and materials
  - Mitigation Measure 10.1.1 – Educate the public about the hazardous materials to which they may be exposed and how to identify them (Priority = Under Study)
- Objective 10.2 – Develop program to minimize the effects of a hazmat release
  - Mitigation Measure 10.2.1 – Develop a list of preventive measures to protect the public (Priority = Under Study)
  - Mitigation Measure 10.2.2 – Encourage businesses that work with hazardous materials to install preventive measures that contain or limit hazmat releases (Priority = Under Study)
  - Mitigation Measure 10.2.3 – Encourage high occupancy and critical facilities to install preventive measures that re-circulate air and prevent outside air from entering the facilities (Priority = Under Study)

5.5.4 Human Threat Events/Terrorism

Goal 11: Improve anti-terrorism procedures

Rationale: The one significant terrorist threat to Inglewood was identified as a threat to the Los Angeles Airport, which lies outside the city limits to the west of Inglewood. The Inglewood police department currently cooperates with Los Angeles World Airports Police Department in planning for potential terrorist events.

Actions: There is an ongoing need to review and update anti-terrorism plans. The Police Department Commander for Emergency Response is tasked with improving anti-terrorism procedures and will introduce new items as they become accepted police procedures.

- Objective 11.1 – Periodically assess anti-terrorism plans
  - Mitigation Measure 11.1.1 – Review and update city anti-terrorism plans and procedures with the Los Angeles Airport and Los Angeles City police and homeland security departments (Priority = Under Study)
  - Mitigation Measure 11.1.2 - Create an education program that mirrors the model developed by the Joint Regional Information Center (JRIC), to sensitize public safety employees and the general public to pre-incident indicators of terrorist activities. (Priority = Moderate)
  - Mitigation Measure 11.1.3 - Incorporate terrorism awareness and prevention in on-going Police training programs and day-to-day law enforcement activities. (Priority = Moderate)

- Mitigation Measure 11.1.4 - Develop a training program for line level Public Safety Employees to interdict in pre-incident indicators of terrorist activities. (Priority = Moderate)

5.6 The National Flood Insurance Program

The City of Inglewood joined the NFIP in 1979. It participates under the Regular Phase. Because the City has no land area designated as Special Flood Hazard Areas which are subject to a one percent chance or greater chance of flooding in any one year, the City of Inglewood is designated a Non-Special Flood Hazard Area. It is considered by the NFIP to have a low to medium probability of flooding and historically has experienced no flood events. In July 2006, the City Council adopted an updated ordinance that is in compliance with minimum regulatory standards issued by FEMA. To maintain its good standing in the NFIP, the Public Works Department monitors all new construction and building permits and annually evaluates the status of the City ordinance to ensure that it is in compliance with changes made to the federal law.

5.7 Implementation Strategy

An implementation strategy is the key to any successful planning effort. The implementation strategy identifies who has lead responsibility for the action, the estimated timeframe for completion, and potential funding source(s) to support implementation, and the priority ranking, defined as follows:

- Lead Agency: City Department and/or other agency assigned lead responsibility
- Timeframe: Short-term (less than 2 years); long-term (more than 2 years)
- Funding source(s): Potential internal and external funding source(s)
- Priority Ranking: Critical, High, Moderate or Understudy (as defined in Section 5.4)

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
All Hazards				
1.1.1 - Reactivate the Disaster Council	Information Systems	General Fund	Short-term	**Critical**
1.1.2 - Continue the Advisory Task Force as a Council Board	Information Systems	General Fund	Short-term	**Critical**
1.1.3 - Create a position for a full-time, fully funded Emergency Preparedness Coordinator in Public Safety Systems Section of IT&C	Information Systems	General Fund	Short-term	**Critical**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
1.1.4 - Initiate and maintain comprehensive training programs for city personnel for ICS, etc, for both safety and non-safety personnel	Information Systems	General Fund Federal/State Grants	Short-term	**Critical**
1.1.5 - Create a functional Emergency Operations Center	Information Systems	General Fund Federal Grants (HMGP/PDM)	Short-term	**Critical**
2.1.1 – Conduct an evaluation of the existing warning system in City Hall to determine its efficacy in reaching all people within the building in the event of a hazmat release or potential terrorism event	Information Systems	General Fund Federal Grants	Short-term	**Critical**
2.2.1 – Assess evacuation plans for City Hall to consider the conditions under which evacuation will take place or when the building will be secured with everyone remaining inside	Information Systems	General Fund Federal Grants	Short-term	**High**
2.2.2 - Evaluate Buffer Zone or Evacuation Plans for public facilities and critical facilities (i.e. Water Treatment Plant)	Public Works	General Fund Federal Grants	Short-term	**High**
2.3.1 - Develop and sustain a reliable mass notification system	Information Systems	General Fund Federal Grants	Short-term	**Moderate**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
3.1.1 – Create a website that includes detailed information and links to existing preparedness and mitigation resources addressing earthquake, hazmat release, and terrorism risks	Information Systems	General Fund	Short-term Ongoing	**High**
3.1.2 – Provide information in both English and Spanish	Information Systems	General Fund	Short-term Ongoing	**High**
3.2.1 – Develop a program to create and distribute written materials to educate the public about hazard risks facing the City	Information Systems	General Fund	Long-term Ongoing	**Moderate**
3.2.2 - Sponsor an annual Emergency Preparedness Fair	Information Systems	General Fund	Long-term Ongoing	**Moderate**
4.1.1 – Retain the Advisory Task Force as a permanent City fixture	Information Systems	General Fund	Short-term Ongoing	**Moderate**
4.1.2 – Enhance relationships with the local Chamber of Commerce, Partners for Progress, and local health clinics	Information Systems	General Fund	Short-term Ongoing	**Moderate**
Earthquake				
5.1.1 – Develop a relocation plan or find an alternative facility for the Emergency Operations Center (EOC)	Information Systems	General Fund Federal Grants (HMGP/PDM)	Short-term	**Critical**
5.1.2 – Develop a relocation plan or find an alternative facility for the City's data center	Information Systems	General Fund Federal Grants	Short-term	**Critical**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
5.1.3 – Conduct a study to find a location outside the City to establish a back-up to the City computer system	Information Systems	General Fund Federal Grants	Short-term	**Critical**
5.1.4 – Complete the program to remove the outdated computer aided dispatch (CAD) system from an obsolete main frame computer	Information Systems	General Fund	Short-term Ongoing	**Critical**
6.1.1 - Ensure all new development and redevelopment is sited and constructed in accordance with the General Plan and zoning ordinances.	Building and Planning	General Fund	Long-term Ongoing	**High**
6.1.2 - Adopt, upon approval by the International Code Council (ICC) and the State of California, revisions to the California Building Code which increase seismic resistance of structures to ground shaking and other geologic hazards.	Building and Planning	General Fund	Long-term Ongoing	**High**
7.1.1 – Conduct a geotechnical study to determine if the City Hall lies on the Newport-Inglewood fault	Public Works	General Fund Federal Grants (HMGP/PDM)	Short-term	**Critical**
7.1.2 – Conduct a risk assessment of the City's water treatment plant and City reservoirs	Public Works	General Fund Federal/State Grants	Short-term	**Critical**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
7.1.3 – Identify and acquire an acceptable site for the relocation of the Police Building out of the Newport-Inglewood fault zone	Police	General Fund HMGP/PDM	Short-term	**Critical**
7.1.4 – Establish a non-structural hazard evaluation and risk reduction program for city buildings and departments housing critical functions	Public Works	General Fund HMGP/PDM	Long-term	**Critical**
7.1.5 - Install seismic bracing on all critical IT equipment and back-up power sources.	Public Works	General Fund	Short-term	**High**
7.1.6 - Install seismic bracing bars on main branch library shelves to prevent collapse and public injury	Public Works	General Fund HMGP/PDM	Short-term	**High**
8.1.1 - Establish a methodology for developing a soft story building inventory	Building and Planning	General Fund	Long-term	**Under Study**
8.1.2 – Inventory privately owned soft story buildings in the City	Building and Planning	General Fund	Long-term	**Under Study**
8.1.3 – Inventory privately-owned tilt-up buildings in the City	Building and Planning	General Fund	Long-term	**Under Study**
8.2.1 – Support efforts to seismically retrofit Centinela Hospital to meet the requirements of SB 1953 (Alfred E. Alquist Hospital Seismic Safety Act of 1983)	Information Systems	General Fund	Short-term Ongoing	**Critical**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
8.2.2 - Consider developing a tilt-up retrofit code to encourage retrofit of privately-owned tilt-up buildings	Building and Planning	General Fund	Long-term	**Under Study**
8.2.3 – Conduct a risk assessment of high occupancy buildings and all buildings currently listed as potential post-disaster shelters	Building and Planning	General Fund	Long-term	**Under Study**
8.2.4 - Encourage retrofit of single family homes including bolting to foundations, strengthening cripple walls, and removing or strengthening masonry chimneys	Building and Planning	General Fund Federal/State Grants (HMGP/PDM/CEA)	Long-term	**Under Study**
9.1.1 - Join the Southern California Earthquake Center (SCEC)	Information Systems	General Fund	Short-term	**Under Study**
9.2.1 – Develop and distribute information to citizens	Information Systems	General Fund	Short-term	**Moderate**
Hazmat Releases				
10.1.1 – Educate the public about the hazardous materials to which they may be exposed and how to identify them	Information Systems LA County Fire	General Fund	Long-term	**Under Study**
10.2.1 – Develop a list of preventive measures to protect the public	Information Systems LA County Fire	General Fund	Long-term	**Under Study**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
10.2.2 – Encourage businesses that work with hazardous materials to install preventive measures that contain or limit hazmat releases	Information Systems LA County Fire	General Fund	Long-term	**Under Study**
10.2.3 – Encourage high occupancy and critical facilities to install preventive measures that re-circulate air and prevent outside air from entering the facilities	Information Systems LA County Fire	General Fund	Long-term	**Under Study**
Human Threat Events/Terrorism				
11.1.1 – Review and update city anti-terrorism plans and procedures with the Los Angeles Airport and Los Angeles City police and homeland security departments	Police	General Fund	Short-term Ongoing	**Under Study**
11.1.2 - Create an education program that mirrors the model developed by the Joint Regional Information Center (JRIC), to sensitize public safety employees and the general public to pre-incident indicators of terrorist activities	Police	General Fund	Short-term Ongoing	**Moderate**
11.1.3 - Incorporate terrorism awareness and prevention in on-going Police training programs and day-to-day law enforcement activities	Police	General Fund	Short-term Ongoing	**Moderate**

Mitigation Measures	Lead Agencies	Funding Source(s)	Timeframe	Priority Ranking
11.1.4 - Develop a training program for line level Public Safety Employees to interdict in pre-incident indicators of terrorist activities.	Police	General Fund	Short-term Ongoing	**Moderate**

Table 5.1: Mitigation Measures - Summary

6.0 Plan Maintenance

Title 44 of the *Code of Federal Regulations* (CFR) Section 201.6(c)(4) requires a hazard mitigation plan that includes a description of the method and scheduling of monitoring, evaluating, and updating this mitigation plan within a 5-year cycle. The plan maintenance section of this document details the formal process that will that ensure that the City of Inglewood local hazard mitigation plan remains an active and relevant document. The maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an updated plan every 5 years. This section also describes how the City will integrate public participation throughout the plan maintenance and implementation process. Finally, this section explains how the City intends to append the mitigation strategies outlined in this plan onto the existing city general plan.

6.1 Plan Implementation

The effectiveness of the City's local hazard mitigation plan depends on the implementation of the plan and incorporation of the proposed mitigation measures into existing City plans, policies, and programs. The local hazard mitigation plan includes a range of mitigation measures that, if implemented, would reduce loss from high risk hazard events in the City of Inglewood. Together, the mitigation measures in the plan provide the framework for activities that the City can choose to implement over the next 5 years. The Local Planning Team and the Local Advisory Task Force have prioritized the plan's goals and identified measures to be implemented according to the Implementation Strategy outlined in Section 5 of this Plan. Integration with on-going City programs and processes is essential to the success of the Implementation Strategy. For example, appending this Plan to the Public Safety Element of the General Plan will ensure consistency between policies and programs designed to reduce future exposure to the hazards and risks identified in this mitigation plan. Additional mechanisms to support plan implementation include the annual budget process, the Capital Improvement Plan, Redevelopment Projects, and the zoning and building code update process.

The City of Inglewood Deputy City Administrator/CIO will be responsible for overseeing the plan's implementation and maintenance and will be supported by the newly created Emergency Preparedness Coordinator, the existing Police Department Commander for emergency response, and the continuation of the Local Advisory Task Force, tentatively designated as the Emergency Preparedness Council Board. The Emergency Preparedness Coordinator will assume lead responsibility for facilitating plan implementation and maintenance meetings of the Council Board that will be tasked with oversight, review and update of the plan once the Board has been created by the City Council.

6.2 The Emergency Management Council Board

The Local Hazard Mitigation Plan recommends that the Local Advisory Task Force be retained as an oversight Council Board and an active participant in the maintenance strategy for the Local Hazard Mitigation Plan. The Board should include representation from the City, the citizens of Inglewood, and other stakeholders as it was constituted as a task force. The Board will convene quarterly to oversee the implementation of mitigation measures and will convene annually to conduct an annual review of the Local Hazard Mitigation Plan.

6.3 The Annual Review of the Local Hazard Mitigation Plan

The annual review will be an evaluation of progress of mitigation measures contained in the Local Hazard Mitigation Plan. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impact on the planning area
- Review of successful mitigation measures identified in the plan
- Brief discussion about why critical and high priority measures were not completed
- Re-evaluation of the goals and priorities to determine if priorities should be amended (such as changing a moderate priority measure to a high priority measure if funding becomes available to implement it)
- Recommendations for new mitigation measures
- Changes in or potential for new funding options (grant opportunities)
- Impact of any other planning programs or initiatives within the City that involve hazard mitigation

The Emergency Preparedness Coordinator will create a template to guide the Board in preparing a progress report. The Board will provide feedback to the coordinator on items included in the template. The Board will then prepare a formal annual report on the progress of the Local Hazard Mitigation Plan. This report will be:

- Posted on the City website
- Provided to the local media through a press release
- Presented in the form of a council report to the Inglewood City Council

In order for recommendations to be considered by the City in the budget process, the annual review will be completed and submitted to the City Council before August 1 of every calendar year.

6.4 Local Hazard Mitigation Plan Update

In accordance with federal requirements, the City of Inglewood intends to update its Local Hazard Mitigation Plan on a 5-year cycle from the date of the initial plan adoption.

The cycle may be accelerated to less than 5 years based on one of the following triggers:

- A Presidential Disaster Declaration that impacts the City of Inglewood
- A hazard event that causes loss of life
- A comprehensive update of the City of Inglewood general plan

It will not be the intent of this update process to start from scratch and develop a new complete hazard mitigation plan for the City of Inglewood. The update will be based on needs identified by the Deputy City Administrator/CIO with the advice of the Emergency Preparedness Council Board and will lead to a draft update that will be made available for City, citizen, and stakeholder review before being submitted to the City Council for adoption.

6.5 Continued Public Involvement

The public will continue to be apprised of Local Hazard Mitigation Plan actions through the City website and by distributing copies of the annual progress reports through the City of Inglewood Library system. All proposed changes to the plan will be subject to citizen review prior to City Council action. The City will follow its standard public input process, consistent with the process used in initial plan development which is described in Section 2 of this Plan.

7.0 REFERENCES

FEMA 386-2, August 2001, State and local mitigation planning, How-to guide, Identifying hazards and estimating losses

Bryant, W. and Hart, E., 2007, Alquist-Priolo Earthquake Fault Zones, Fault-rupture hazard zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps, Special Publication 42, California Geological Survey.

Southern California Earthquake Center, http://www.data.scec.org/chrono_index/longbeac.html, accessed, January 2009.

Wald, D. J., Quitoriano, V., Heaton, T. H., and Kanamori, H., 1999, Relationships between peak ground acceleration, peak ground velocity and Modified Mercalli intensity for earthquakes in California: Earthquake Spectra, v. 15, no. 3, pp. 557–564.

United States Geological Survey, 2008, 2008 United States National Seismic Hazard Maps, http.geohazards.cr.usgs.gov/eq/pubmaps/US.pga.050.map.gif, accesed January, 2009

United States Geological Survey, 2009, Historic United States Earthquakes, http://earthquake.usgs.gov/regional/states/historical.php?, accessed January 2009.

Seligson, H.A., and R.T. Eguchi, 2005, The True Cost of Earthquake Disasters: An Updated Tabulation of Losses for the 1994 Northridge Earthquake, Proceedings of the International Symposium on Earthquake Engineering, Awaji, Japan, Jan 13-16, 2005.

City of Inglewood, August 2006, General Plan Update, Final Technical Background Report

United States Geological Survey, 2009, USGS ShakeMap Archive, http://earthquake.usgs.gov/eqcenter/shakemap/sc/shake/Newport_Inglewood6.9_se/#download, accessed January, 2009.

City of Inglewood, September 2004, Natural Hazard Mitigation Plan, Earthquake Hazards in Southern California.

City of Inglewood, February 1999, SEMS Multihazard Functional Plan.

City of Inglewood, July 2008, City Hall Seismic Evaluation Report

City of Inglewood, December 2007, City Service Center Seismic Evaluation Report

City of Inglewood website, Accessed 2009, http://www.cityofinglewood.org/default.asp

Appendix A: Quarterly Progress Reports

November 3, 2008

City of Inglewood and I.T. Crisis Services, Inc.
Development of the Local Hazard Mitigation Plan

First Quarterly report by Elliott Mittler, ITC Project Manager

Activities in the first quarter of this project have led to a successful ramp up of the project. Today, I.T. Crisis Services (ITC) has established an excellent working relationship with the City of Inglewood and both ITC and the City are working jointly to (1) establish a risk analysis of natural and man-made hazards impacting the City, (2) engage individual citizens and stakeholders to provide their input in order to participate in establishing priorities in hazard mitigation, and (3) plan for the development of a multi-hazard mitigation plan.

The initial planned tasks of this project were to hold a kick off meeting, finalize the project details, begin holding monthly meetings of the Planning Team, and to establish an Advisory Task Force. All but the latter have been completed, and the establishment of an Advisory Task Force is close to completion. Meetings were held at the City or by conference call and are shown in Table 1 below.

Table 1: Meetings with the City and ITC

Meeting	Date
Kick-off Meeting	July 30, 2008
Planning Meeting	September 11, 2008
Planning Meeting	October 7, 2008
Partners for Progress Luncheon Presentation Planning Meeting	October 14, 2008
Partners for Progress Luncheon Presentation	October 15, 2008
Advisory Task Force Composition Discussion	October 29, 2008
Planning Meeting	October 30, 2008
GIS Data Meeting	October 30, 2008

Hazard identification was planned to start during this quarter. As of the end of this quarter, about 99% of the anticipated data has been received from the City GIS department. It is anticipated that ITC will at least be able to provide maps of the data with underlying supporting data for the first meeting of the Advisory Task Force on November 18. All other hazard identification and research based on the data received appears to be on schedule.

During this time, the City provided documents related to their earlier hazard mitigation plans and other mitigation activities they have conducted. ITC has begun evaluating these documents and will integrate their findings with the results of risk and vulnerability analyses.

While the project has gotten off to a slower than expected start, the delays have permitted ITC and City staff to develop an excellent working relationship, leading to an expectation that the project will be able to meet all overall project goals and complete this project on schedule.

Next Steps:

At the start of the upcoming quarter, the members of the Advisory Task Force will be named and they will meet on November 18, 2008. Following the Advisory Task Force Meeting, ITC will meet with the City to finalize stakeholder participants who will gather in January and possibly February to provide input to an early draft of the Hazard Mitigation Plan that ITC will prepare by the start of the meetings. By the end of the quarter, the majority of the input to prepare the Hazard Mitigation Plan will have been collected so a draft can be prepared for City discussion.

End of Report

February 5, 2009

City of Inglewood and I.T. Crisis Services, Inc.
Development of the Local Hazard Mitigation Plan

Second Quarterly report by Elliott Mittler, ITC Project Manager

Activities in the second quarter of this project have concentrated on the development of future stakeholder meetings and the active involvement of the Advisory Task Force (ATF) in the development of the City's hazard mitigation plan. I.T. Crisis Services (ITC) and the City planning team have worked jointly on these tasks and were successful in involving representatives of the City's most significant organizations and companies on the ATF.

The planned tasks of this project for this time period were to engage the Advisory Task Force, establish a preliminary identification of natural and man-made hazards affecting the City, identify potential stakeholders for future stakeholder meetings, and prepare agendas and content of stakeholder meetings. All of these tasks have been either completed or will be in the first part of the next quarter when stakeholder meetings will be held. To accomplish these tasks, meetings were held at the City or by conference call and are shown in Table 1 below.

Table 1: Meetings with the City and ITC

Meeting	Date
Planning Meeting	November 17, 2008
Advisory Task Force First Quarterly Meeting	November 18, 2008
Planning Meeting	December 16, 2008
Planning Meeting	January 21, 2009

A preliminary hazard assessment for the city of Inglewood was completed and presented to the ATF during the first quarterly meeting on November 18, 2008. Using a risk ranking matrix, hazards were identified as low, medium or high threat to the city. One of the objectives of the ATF meeting was to use this preliminary hazard list to achieve a consensus on hazards to be included in the plan. In the course of the discussion with various task force members, the following hazards were identified as potential threat to the community:

- Earthquake – High
- Hazmat Release – High
- Human Threat Events/ Terrorism – High
- Train Derailment – High
- Airplane Crash – Medium
- Civil Unrest – Medium

An additional request for data and study reports was made to the various ATF members to enable a more complete risk assessment. The following have been received and assessed by ITC team:

- A report on chlorine gas release scenarios and dispersion analysis for the Sanford M. Anderson water treatment plant
- List of Schools of Inglewood Unified School District 2008/2009

Progress has been made in collecting data on critical infrastructure, public buildings and general building stock (residential, industrial, and commercial) for the city. FEMA defines the risk assessment process as a multi-step effort in "Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA 2001)". The steps include: Identify and screen your hazards, profile hazards, inventory assets, estimate losses, and indentify future risks. Using this approach, we have identified and screened the hazards for the city and we are in the process of developing profiles of the identified hazards. These profiles will include basic information about the hazard to help one understand its nature and the subsequent loss estimation that will be performed as a part of the project. Also, included in the profile will be information on past occurrences in the city, and the potential for future occurrence. Preliminary results of earthquake loss estimation using FEMA's HAZUS® software has been completed for the 6.9 magnitude Newport Inglewood scenario (USGS).

A hazard mitigation planning survey was distributed at the Advisory Task Force meeting, and subsequently emailed to all ATF members and distributed at the Inglewood Executive

Staff Meeting. Five responses were received and the results tallied. Additional responses received during the next quarter will be incorporated in the summary.

The Planning Team finalized the list of participants and agreed upon draft agendas for the two stakeholder workshops scheduled for February. The City targeted January 28 for preparing and sending out the invitation letters with a requested RSVP date of February 13.

Next Steps:

At the start of the upcoming quarter, the members of the Advisory Task Force will meet for their second quarterly meeting on February 19. On the following two days, there will be the first two stakeholder meetings. A third stakeholder meeting is scheduled for March. ITC will work with the City to finalize the agenda, presentation materials, and discussion questions for the first two workshops, and finalize the date, participants, and preparations for the third workshop. By the end of the quarter, the stakeholder meetings will have been held, information from the meetings will have been used to assist in framing the Hazard Mitigation Plan, and the assessment of hazards facing the City will be completed.

End of Report

May 12, 2009

City of Inglewood and I.T. Crisis Services, Inc.
Development of the Local Hazard Mitigation Plan

Third Quarterly report by Elliott Mittler, ITC Project Manager

Activities in the third quarter of this project were dominated by the completion of three stakeholder workshops and the continued active involvement of the Advisory Task Force (ATF) in the development of the City's hazard mitigation plan. I.T. Crisis Services (ITC) and the City Planning Team have worked jointly on these tasks and held successful stakeholder workshops with small but enthusiastic audiences. In addition, ITC has incorporated the information generated from the workshops and planning meetings in its development of a first draft of the local hazard mitigation plan. At the end of the quarter, ITC has completed its assessment of risks facing the City.

The planned tasks of this project involving the City for this time period were to engage the Advisory Task Force in the development of a risk assessment of natural and man-made hazards affecting the City, work with the Planning Team to identify potential stakeholders for stakeholder workshops, prepare and modify agendas and content of stakeholder workshops, conduct stakeholder workshops, and evaluate the results of stakeholder workshops in order to incorporate stakeholder views into the local hazard mitigation plan. All of these tasks, including the assessment of risks, have been completed. To accomplish these tasks, meetings were held at the City or by conference call and are shown in Table 1 below. Stakeholder workshops, which were conducted at Inglewood City Hall, are shown in Table 2 below.

Table 1: Meetings with the City and ITC

Meeting	Date
Planning Meeting	February 10, 2009
Advisory Task Force Second Quarterly Meeting	February 19, 2009
Planning Meeting	March 12, 2009
Planning Meeting	April 16, 2009

Table 2: Stakeholder Workshops

Workshop	Date
First Workshop composed of local business and professional representatives	February 20, 2009
Second Workshop composed of neighborhood and homeowner association representatives	February 21, 2009
Third Workshop composed of Community Emergency Response Team (CERT) members	March 28, 2009

At the second ATF quarterly meeting, held on February 19, ATF members who had returned completed surveys were thanked and others were asked to submit a completed survey. The preliminary results generated from the surveys received to date indicated that earthquakes were singled out as the hazard of most concern. ATF members identified several potential hazard mitigation activities, including the need for continued preparedness efforts such as training and exercises, the need for redundancy and strengthening of utility, infrastructure, communications and information technology, and the seismic vulnerability of the Civic Center and Police Building which are located on the Newport-Inglewood Fault.

Public Works reported that the seismic study of the Civic Center Building and the Service Center are in progress. There was also a discussion led by the Police Department of the options being considered for the relocation of the Police Building.

Additional discussion following the presentation focused on the lack of a dedicated Emergency Management Coordinator for the City or dedicated emergency management staff within individual City departments. At the time of this meeting, there was no single individual responsible for citywide preparedness, response, recovery and mitigation. Individuals in various departments are assigned emergency management responsibilities in addition to their day-to-day full time duties. Suggestions for how to remedy the situation included reprioritizing funding decisions, allowing staff to volunteer their time, and establishing a dedicated core team.

At the second Stakeholder workshop, Mike Falkow reported that the City Council had approved a proposal to appoint one of the Assistant City Administrators to oversee the City's emergency management activities and that this function would be incorporated into his job. He also reported that the City has acquired a new mobile satellite communications system that is expected to be functional in the event of a severe earthquake.

ITC conducted three stakeholder workshops during this quarter. Please see the attached summaries for topics discussed.

Next Steps:

At the start of the upcoming quarter, the members of the Advisory Task Force will meet for their third quarterly meeting on May 13. The focus of the meeting will be to discuss mitigation goals and activities; and then priorities. Following this meeting, ITC will work with the City Planning Team to finalize the draft of mitigation goals, a prioritized list of mitigation activities that it will undertake in the next few years, and a tentative schedule for the timing of the review process that will include the Planning Team, the ATF, the public, and the City Council. The tentative schedule will define the work to be completed during this quarter.

End of Report

August 10, 2009

City of Inglewood and I.T. Crisis Services, Inc. (ITC)
Development of the Local Hazard Mitigation Plan

Fourth Quarterly report by Elliott Mittler, ITC Project Manager

Activities in the fourth quarter of this project were dominated by the submission of the first draft of the Local Hazard Mitigation Plan to the City of Inglewood and the completion of the revised first or "final" draft of the plan. I.T. Crisis Services (ITC) and the City Planning Team (PT) have worked jointly on these tasks with the continued active involvement of the Advisory Task Force (ATF). On July 21, 2009, the plan was placed on the City Council agenda and calendared for a public hearing on August 18, 2009.

The planned tasks of this project involving the City for this time-period were to have the City Planning Team and the Advisory Task Force comment on the first draft of the plan and to discuss mitigation measures that the City might include in the plan. The PT and ATF met on May 13, 2009 and July 9, 2009 at the Inglewood City Hall and the Police Building respectively specifically to discuss mitigation measures the City should include in the plan and to assign priorities of the mitigation measures. (See Table 1 below) Following the July 9, 2009 meeting, Elliott Mittler, the ITC Project Manager, met with Michael Falkow and Lt. James Madia one-on-one to get further input on mitigation measures and priorities. By the end of this quarter, ITC had submitted a first draft of the plan that was sent to the Planning Team and ATF for comment and a revised first or "final" draft that will be posted on the Internet for public review at the beginning of August.

Table 1: Meetings with the City and ITC

Meeting	Date
Planning Meeting	May 13, 2009
Advisory Task Force Third Quarterly Meeting	May 13, 2009
Planning Meeting	July 9, 2009
Advisory Task Force Fourth Quarterly Meeting	July 9, 2009

At the third ATF quarterly meeting, held on May 13, 209, the Planning Team and ATF members discussed both structural and non-structural mitigation measures that might be included in the local hazard mitigation plan. Topics ranged from the retrofit of City Hall to home retrofit programs and financial incentives and funding opportunities for homeowners to voluntarily retrofit their houses. Michael Falkow described the state of information technology in the City and efforts to get the current system updated and moved to a more earthquake safe location. He further said that critical functions of the City (finance, public works, building and planning, parks and recreation, and housing and code) were all located in City Hall and therefore at risk from a major earthquake on the Newport Inglewood Fault. Both Michael Falkow and Lt. James Madia agreed that the evacuation plans in City Hall are inadequate, some locations in the building are isolated from fire alarm horns, and there is a critical need to establish a warning system in City Hall. Others suggested that warning systems in all City-owned buildings be evaluated and updated if needed. Because of the earthquake threat, there was a recommendation that the city complete an evaluation of possible alternative sites for an Emergency Operations Center (EOC) if City Hall collapses or the building is declared unsafe. The current plan is to use Parks and Recreation facilities.

Both the Planning Team and ATF concurred that the number one priority of the City is to relocate the Police Building, which would also include an alternate EOC. Other critical items were the need for a geotechnical study of City Hall to determine if it lies on the Newport Inglewood Fault and a risk analysis for the Water Treatment Plant. Finally, the group said that preliminary studies need to be conducted of high-rise senior housing (non-ductile concrete structures constructed around 1977) and buildings identified as shelter locations.

At the end of the meeting, Craig Bragg reported that the City does not have an inventory of soft-story buildings or tilt-up buildings. He said there are about 300 tilt-up buildings and the City asks new owners at the time of sale to voluntarily retrofit them. So far, about 15% of the owners have voluntarily complied. Following his comments, the group recommended that these efforts be supported and included as mitigation measures.

At the fourth ATF meeting held on July 9, 2009, the only topic was the review of Section 5 of the first draft of the City Local Hazard Mitigation Plan focusing on mitigation measures. Every item in the first draft was discussed and a consensus was reached on the priority for each mitigation measure. During the discussion, a few additional measures were suggested

to be included in the revision of the first draft. It was decided at this meeting that priorities be divided into four categories:

- Critical – most important actions to be implemented by the City
- High – to be implemented by the City in short-term future
- Medium – to be implemented when funding and resources become available
- Under Study – under consideration pending completion of formal assessment/study

ITC incorporated all comments from the Planning Team and ATF into a revised first or "final" draft of the Local Hazard Mitigation Plan. This draft was completed by the end of July.

Many mitigation discussions centered around the location of City Hall in the Newport Inglewood AP Fault zone. The point was raised that the already planned mitigation for the facility did not appear to take into account fault rupture, which could be a problem if in fact the facility did lie on the fault. The difference in having the structure next to an active fault and having the building transecting the active fault will have a tremendous impact in determining the City's ability to respond to the needs of citizens when an earthquake occurs on the segment. It was strongly recommended that a geotechnical study proceed to determine the exact location of the fault with respect to City Hall. Charles Huyck agreed to obtain a preliminary quote from URS and did so prior the end of this quarter.

This quote was provided by URS, who noted that the school that is just to the west of City Hall is planning to expand and, according to state law, would be required to have a trenching study as part of its application for expansion. The City should contact Beverly Pye at the Inglewood School District to get the results of their trenching study if it has been completed or get the application number from Ms. Pye to examine the data filed with the state. The school district trenching study is not a substitute for one conducted for City Hall but it will provide additional information concerning the location of the fault.

Next Steps:

At the start of the upcoming quarter, the final draft of the plan will be submitted to the City so that it may be posted on the City Internet site for public review and comment. On August 18, the City Council will meet, hold a public hearing on the plan, and vote on adopting the plan. During this time, ITC will informally submit a copy of the plan to CalEMA to get their comments and recommendations for change that can be incorporated before the plan is formally sent to CalEMA and FEMA for review and approval. The final goal is to have the City Council adopt the plan and then have FEMA approve the plan in the next few months.

End of Report

Appendix B: ATF Survey

City Of Inglewood Hazard Mitigation Plan
Advisory Task Force Survey

This survey will assist the City of Inglewood and its consultant team to prepare the Hazard Mitigation Plan. Please take a few moments to fill it in and return by email to Paula Schulz at Paula@itcrisis.com by December 15, 2008. Please note that because of the diverse participation on the Advisory Task Force, we have used the term "agency" as an umbrella designation that includes agencies, departments, organizations, and private sector participants. Use additional sheets and attach documents as needed. If you need assistance, please feel free to contact Paula at (707) 939-8963. Thank you for your participation.

Name: _____

Position: _____

Agency: _____

Address: _____

_____

Phone: _____ Fax: _____

Email: _____

1. What natural or technological hazards concern you most from the standpoint of your agency or organization responsibilities? *(Please mark [X] all that apply, and underline the hazard that concerns you the most)*

   [ ] Airplane Crash
   [ ] Civil Unrest
   [ ] Dam Failure
   [ ] Earthquake
   [ ] Flood/Winter Storms
   [ ] Hazardous Materials Release
   [ ] Human Threat/Terrorism
   [ ] Hurricane Wind/Storm Surge
   [ ] Nuclear Incident
   [ ] Tornado
   [ ] Train Derailment
   [ ] Tsunami
   [ ] Wildfire
   [ ]Other *(please write in)* _____

2. Does your agency own, operate or provide community services that you believe may be at risk from natural or technological hazards? [ ] Yes [ ] No *(please describe below)*

_____

_____

_____

_____

3. What are you most concerned about in terms of being able to provide services in the event of a natural or technological hazard event?

_____

_____

_____

_____

4. Have steps been taken by your agency to reduce the risks to your facilities or operations that may be posed by natural or technological hazards?
(Please describe ordinances, programs or plans you have in place to reduce risk. Attach additional sheets as necessary.)

_____

_____

_____

_____

5. What budget mechanisms, and internal or external funding sources are available to you to undertake hazard mitigation, vulnerability, or risk reduction activities? (*please list*)

_____

_____

_____

_____

6. From your agency or organization standpoint, what is the most important thing that could be done to reduce your vulnerability from the potential effects of natural or technological hazards?

_____

_____

_____

_____

7. Do you believe there are opportunities for interagency or inter-jurisdictional solutions to reducing vulnerability from natural or technological hazards? *(Please identify the hazard and possible opportunities.)*

_____

_____

_____

_____

8. May we contact you for additional information as we proceed through the planning process? [ ] Yes [ ] No

Appendix B-1: ATF Survey – Summary of Responses and Trends

Mitigation Survey Questions

- Hazards most concerned about
- Community services at risk
- Service provision concerns
- Risk reduction steps taken
- Budget mechanisms/funding sources
- Priority for reducing vulnerability
- Interagency opportunities

Top Hazards

- Earthquake
- Airplane Crash
- Hazardous Materials
- Human Threat/Terrorism

Additional Hazards

- Civil Unrest
- Flood/Winter Storm
- Nuclear Incident
- Utility Failure
  - Water
  - Power
- Wildfire
- Oil/Gas Line Ruptures
- Recycled Water System for Fire Protection

Service/Facilities at Risk:

- Field Crews & Vehicles
- Water & Power System Failures
- Buildings Housing Critical and Day-to-Day Operations

Service Provision Concerns:

- Personnel & Public Safety
- Maintain Critical Services
- Computer Systems/Technological Resources
- Loss of Power
- Damage to Transportation System

Risk Mitigation Steps:

- Disaster Plans and Drills
- Training
- Communications/Interoperability
- Emergency Power
- Stockpile Supplies
- System Redundancy
- Post-Earthquake Engineering Surveys

Budget/Funding:

- Annual Budget Process/General Fund
- State and Federal Grants/Programs
- Bonds and Loans

Vulnerability Reduction Priorities:

- Seismic Retrofit of Civic Center Facilities
- Joint Exercises
- Computer Generated Damage Models for Water Systems and Infrastructure

- Evacuation Training and CERT Training

- Off Site Data Storage and Processing
- Develop Hazard Mitigation Plan

Opportunities for Collaboration:

- Continue Advisory Task Force
- Offer CERT Trainings
- Purchase Transportable Generators
- Share Equipment and Expertise
- Set Common Priorities
- Mutual Aid Agreements
- Citywide Planning Meetings and Annual Drills

EARTHQUAKE IS THE BIGGEST CONCERN!

Solutions:

- Preparedness and Training
  - CERT
- Facilities
  - Evaluation
  - Retrofit
- Infrastructure
  - Strengthening
  - Redundancy

Appendix C: Stakeholder Workshop

City of Inglewood
Local Hazard Mitigation Plan

Stakeholders Workshop

I.T. Crisis Services, Inc. (ITC)

Workshop Agenda

ITC

- 9:00 Welcome and Introductions
- 9:30 DMA 2000 and Mitigation Planning
- 9:45 Hazard Description & Discussion
- 10:15 Break
- 10:30 Facilitated Discussion
- 11:45 Next Steps

Workshop Objectives

- To introduce workshop participants to the City of Inglewood Hazard Mitigation Planning Process
- To obtain input from workshop participants about concerns and suggestions for reducing their risk from identified hazards
- To meet federal DMA 2000 planning process requirements

Approach to City of Inglewood Local Hazard Mitigation Plan

Mitigation Planning is a ***process*** for local governments to identify policies, activities, and tools to implement mitigation actions. Mitigation is any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. This process has four steps:

- organizing resources;
- assessing risks;
- developing a mitigation plan; and
- implementing the plan and monitoring progress

Approach to City of Inglewood Local Hazard Mitigation Plan

In accordance with the federal Disaster Mitigation Act of 2000, every community must have an approved hazard mitigation plan as a condition to receive federal hazard mitigation assistance.

Approach to City of Inglewood Local Hazard Mitigation Plan

Required Plan Elements:

- Planning Process
- Public Participation
- Risk Assessment
- Mitigation Strategy
- Plan Maintenance Process
- Formal Adoption

Approach to City of Inglewood Local Hazard Mitigation Plan

Planning Process Requirements:

- Opportunity for public comment
- Opportunity for involvement from other local, regional, state, federal agencies, academia, businesses, private and non-profit interests
- Incorporation of existing plans, studies, reports, and technical information
- Documentation of the planning process

Benefits of Mitigation

- Saved lives
- Reduced damage to property
- Reduced economic losses
- Minimized social disruption
- Local government to resume operations quickly
- Shorter recovery period for the community
- Improved attractiveness to individuals and businesses

Mitigation Measures

- Prevention
- Property protection
- Public education and awareness
- Natural resource protection
- Emergency services
- Structural projects

Prevention (Future Development)

- Keep a hazard risk from getting worse.
- Ensure that future development does not increase hazard losses.
- Guide future development away from hazards, while maintaining other community goals such as economic development and quality of life.

Property Protection (Existing Development)

- Modify existing buildings subject to hazard risk, or their surroundings
- Directly protect people and property at risk
- Inexpensive measures because often they are implemented or cost-shared with property owners.

Public Education and Awareness

- Inform and remind people about hazardous areas and the measures they can take to avoid potential damage and injury.
- Directed toward property owners, potential property owners, business owners and visitors.

Natural Resource Protection

- Reduce the intensity of hazard effects and improve the quality of the environment and wildlife habitats.
- Parks, recreation, or conservation agencies or organizations usually implement these activities

Emergency Services

- Emergency services protect people before and after a hazard event.
- Most counties and many cities have emergency management offices to coordinate warning, response, and recovery during a disaster.
- Actions taken to ensure the continuity of emergency services are considered to be mitigation.

Structural Mitigation

- Directly protect people and property at risk.
- Called “structural” because they involve construction or modification of man- made structures to reduce injury, damage and improve functionality

Appendix C-1: List of Invited Participants

February 20, 2009:

Partners for Progress
- Hollywood Park Casino
- Hollywood Park Land Company
- The Forum
- Centinela Hospital Medical Center
- Inglewood Park Cemetery
- Inglewood Airport Area Chamber of Commerce
- Los Angeles World Airports

Chamber of Commerce
Real Estate Association
Hagen Group (Commercial Developer)
Los Angeles World Airport (LAX)
Airport Police
LA County Animal Control
Inglewood Unified School District
Private Schools
- Wilder's Preparatory Academy Charter School
- Animo Leadership Charter High School
- St. Mary's Academy

February 21, 2009:

Home Owners Associations (HOA) (with 75+ units)
- Crossroads
- Renaissance
- Carlton Square
- Briarwood

March 28, 2009:

Citizens Emergency Response Teams (CERT) - 165 invitees

Appendix C-2: Stakeholder Workshop Attendees

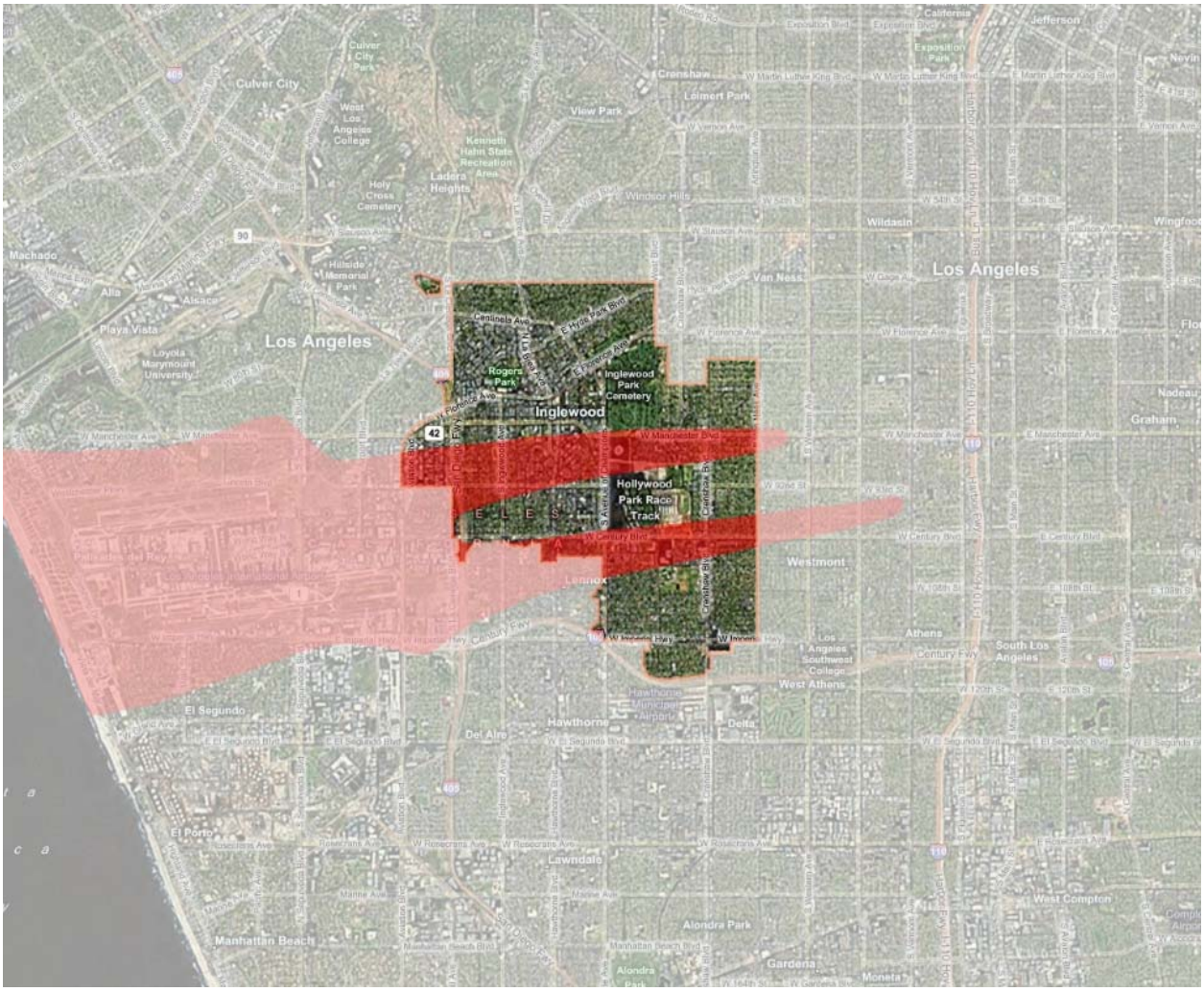
First Stakeholder Workshop – February 20, 2009		
Name	**Organization**	**Title**
Michael Calzada	City of Inglewood	RSI Director
Michael D. Falkow	City of Inglewood	Acting Asst. City Administrator
Soheil Hekmat, MD	Hillcrest Medical Clinic	Medical Director
Micah Herd	Inglewood Police Dept	Grants Coordinator
Charlie Huyck	ITC	Consultant
James Madia	Inglewood Police Dept	Lieutenant
Elliott Mittler	ITC	Consultant
Terri Pond	ITC	Consultant
Paula Schulz	ITC	Consultant
Roland Talton	Inglewood Chamber of Commerce	Past President

Second Stakeholder Workshop – February 21, 2009		
Name	**Organization**	**Title**
June Brown	Briarwood HOA Disaster Committee	
Michael D. Falkow	City of Inglewood	Acting Asst. City Administrator
Kathryn Friar	Briarwood HOA	
Charlie Huyck	ITC	Consultant
Hazel Lee	Briarwood HOA Disaster Committee	Chairperson
Lena McKinnon	Briarwood HOA Disaster Committee	
James Madia	Inglewood Police Dept	Lieutenant
Elliott Mittler	ITC	Consultant
Margaret Morris	Briarwood HOA Disaster Committee	
Rev. Jackie Russell	Faithful Center Bible Church	Disaster Coordinator
Terri Pond	ITC	Consultant
Paula Schulz	ITC	Consultant

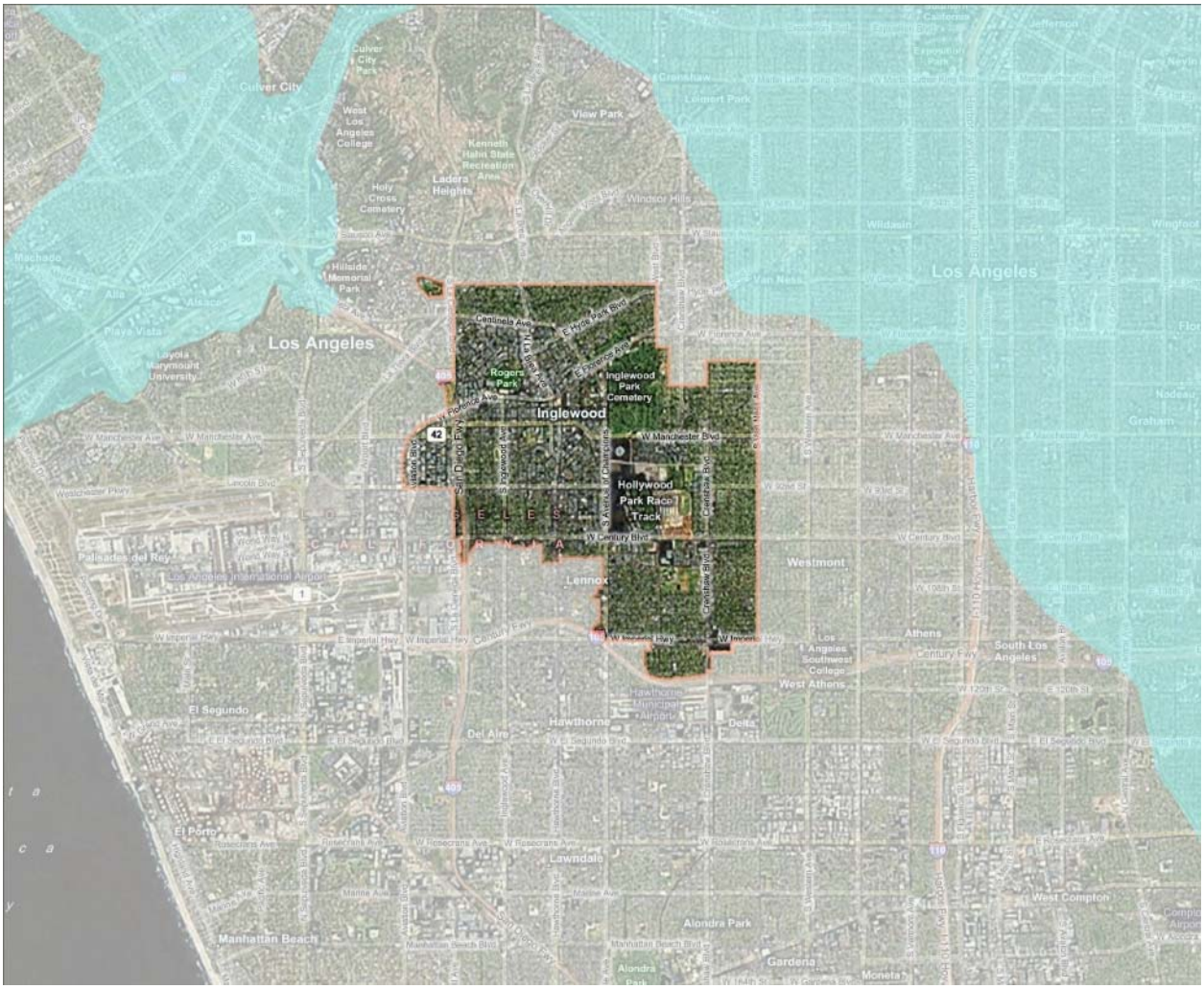
Third Stakeholder Workshop – March 28, 2009		
Name	**Organization**	**Title**
Stewart Bailey	Citizen	
Shannel Brown	Inglewood Police Dept	
Floyd Harris	Inglewood Police Dept	
Charlie Huyck	ITC	Consultant
Henry Harni	HAL Neighborhood Watch	
Richard Konker	Fairview Watchguard	
James Madia	Inglewood Police Dept	Lieutenant
Elliott Mittler	ITC	Consultant
Mari Morales	Citizen	
Darryl Rouzan	Inglewood Police Dept	
Terri Pond	ITC	Consultant
Paula Schulz	ITC	Consultant

Appendix D: Hazard Screening Maps

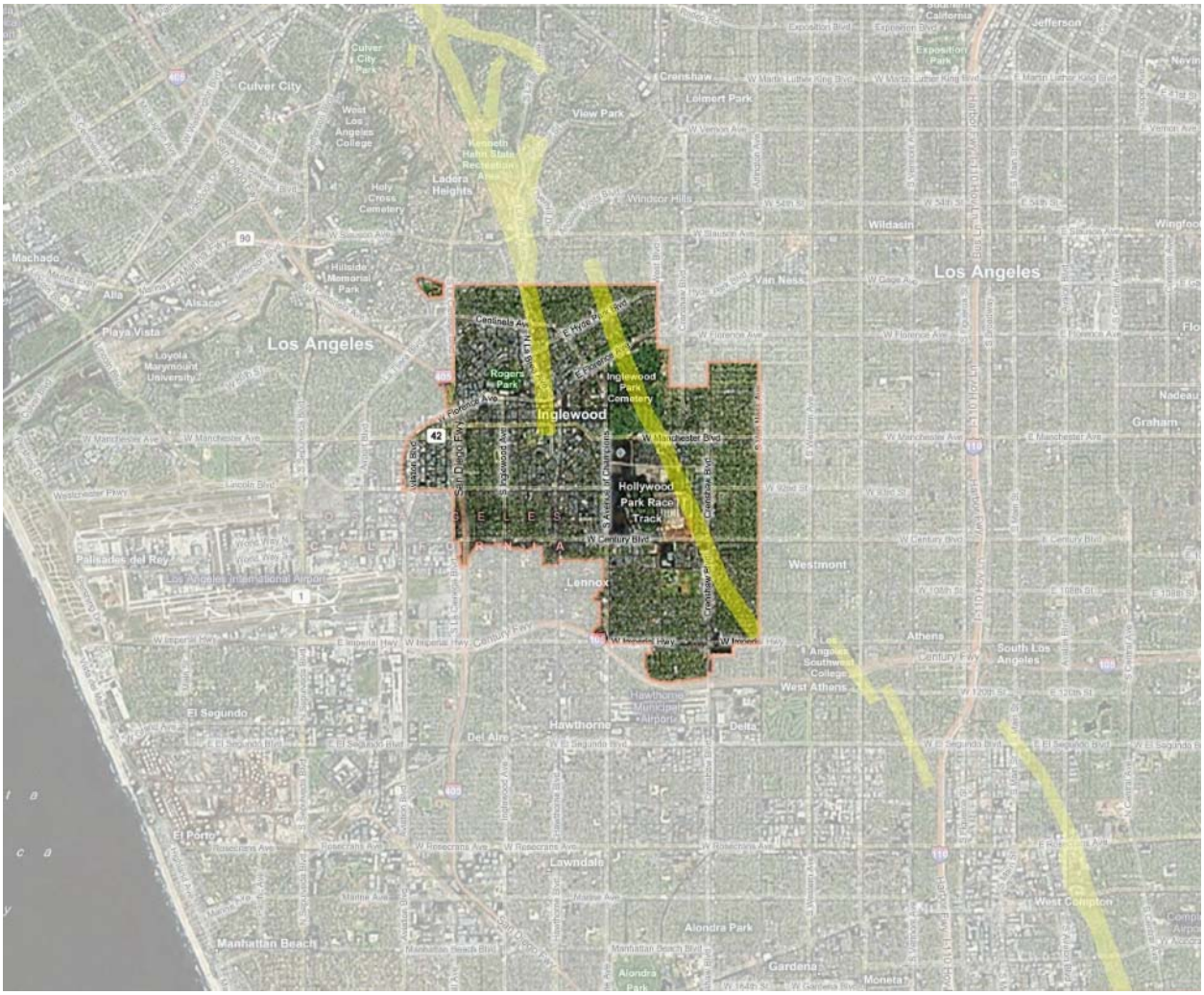
Map 1: 65 Decibel Noise Contours



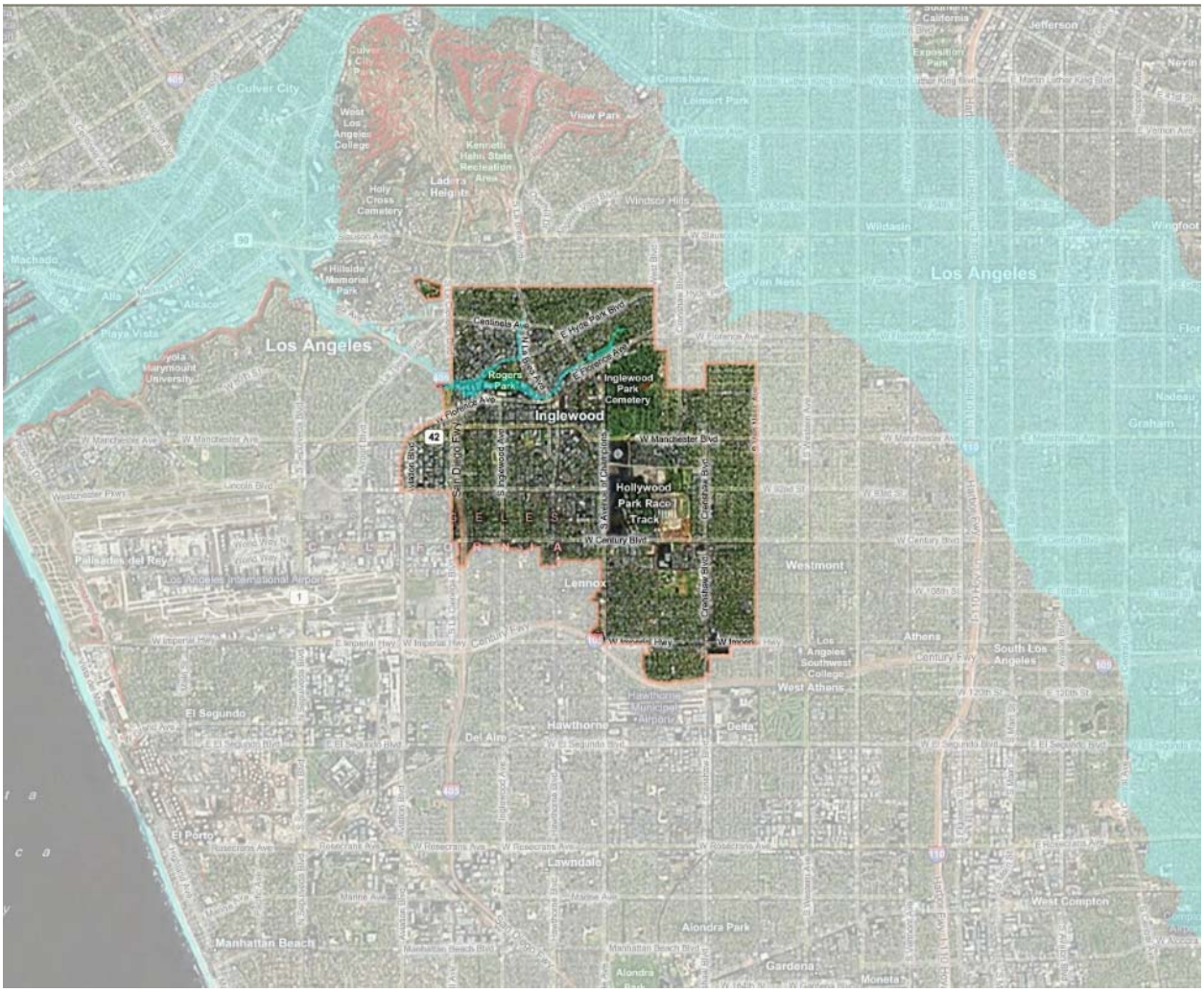
Map 2: Dam Inundation



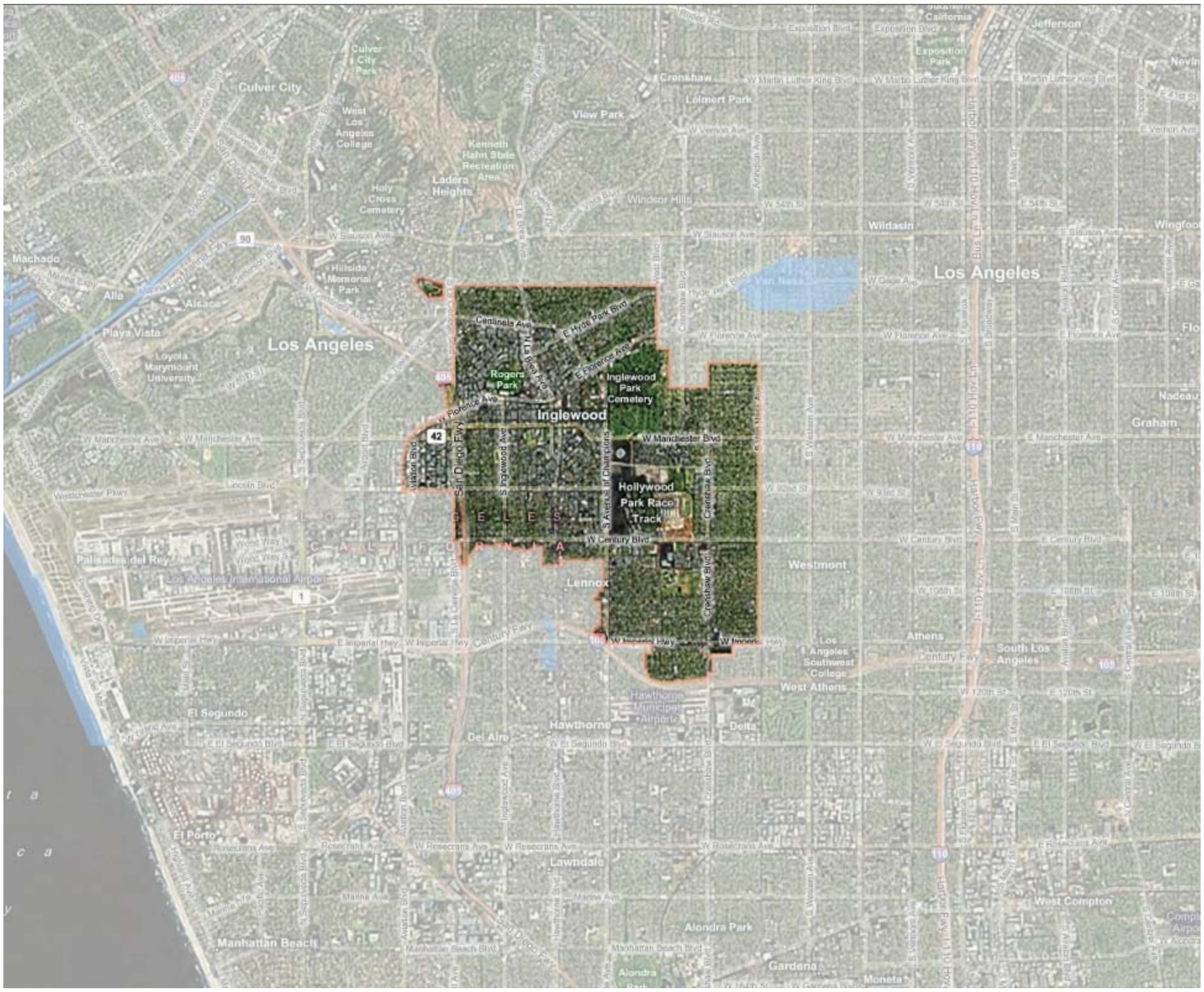
Map 3: Alquist Priolo Fault Zones



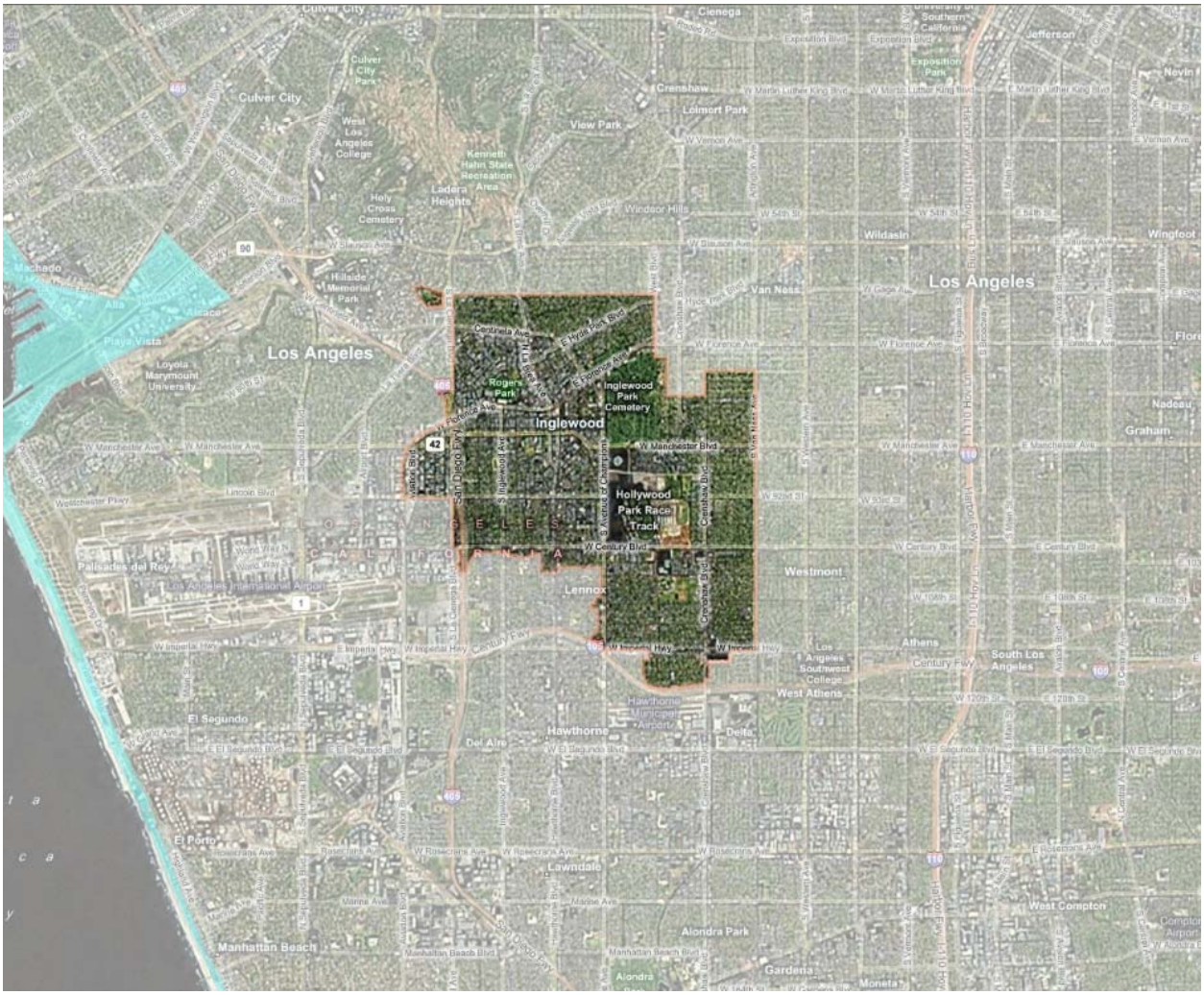
Map 4: Landslide and Liquefaction



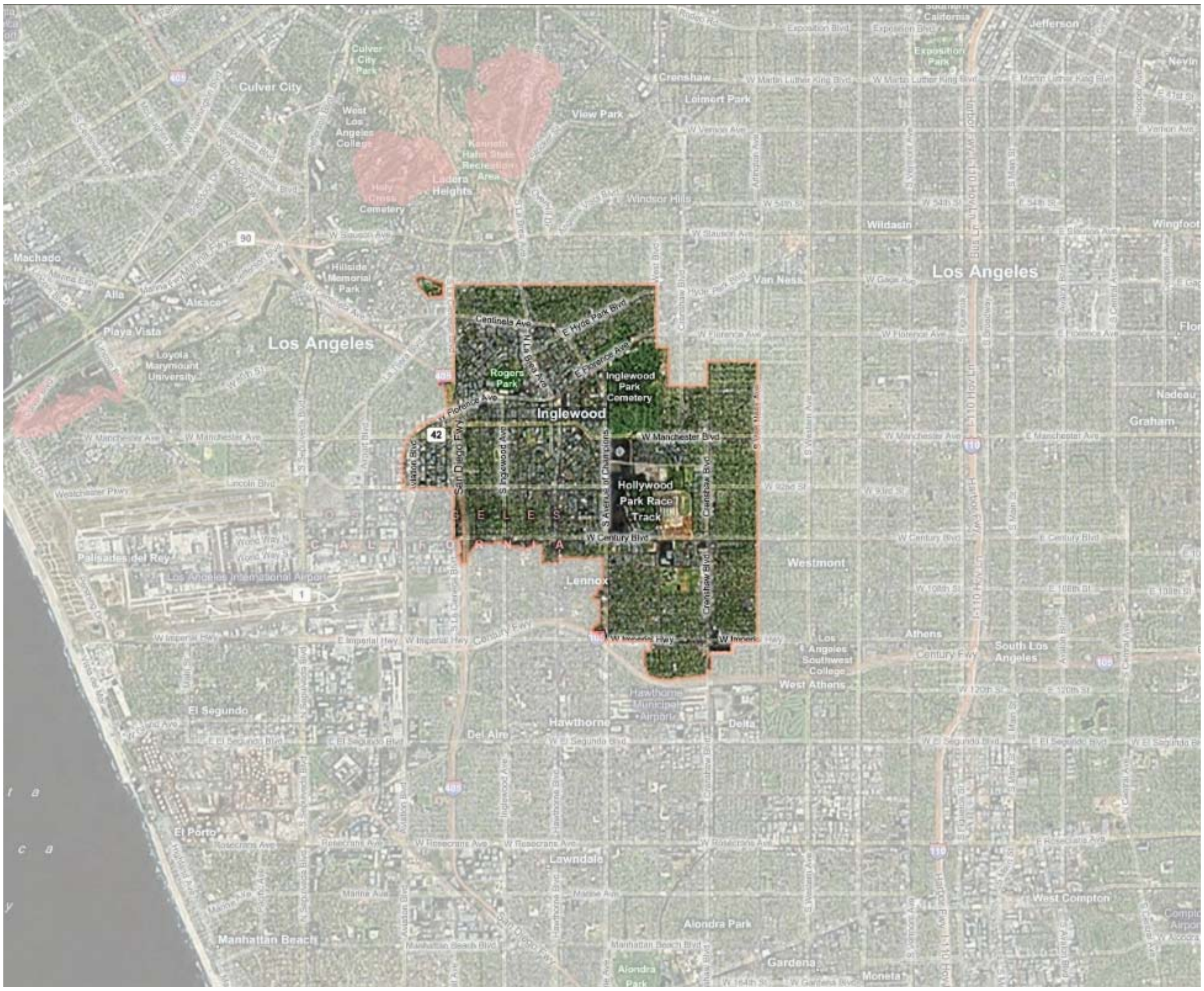
Map 5: Flood / Winter Storms



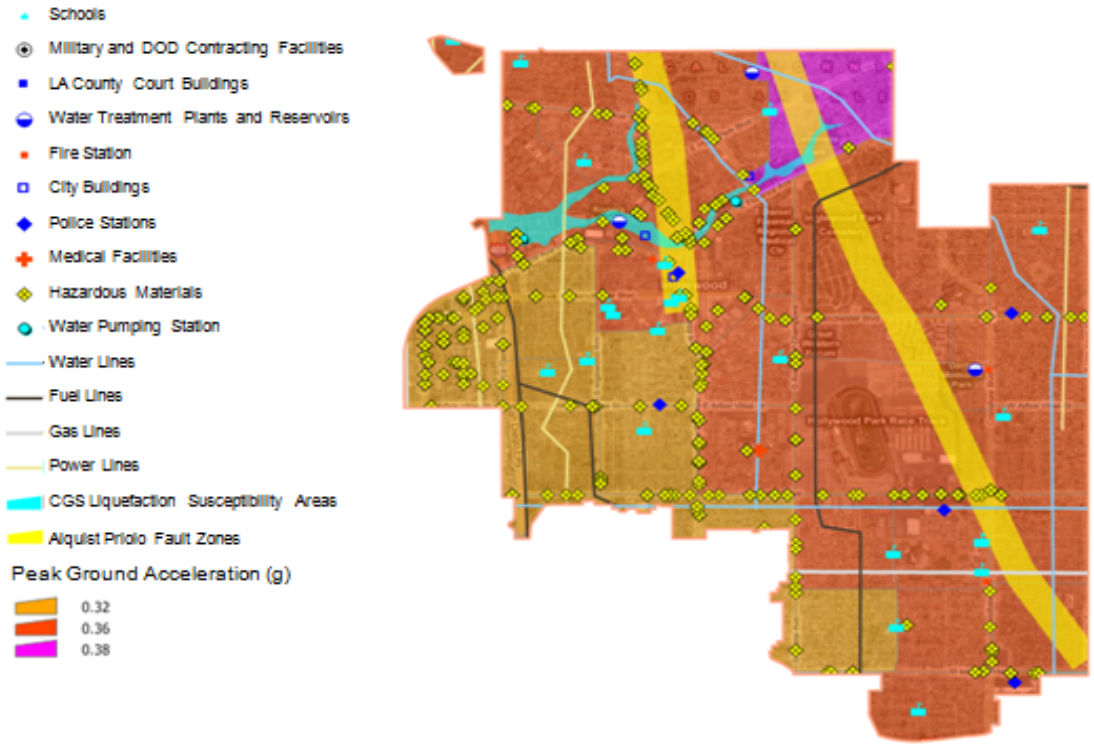
Map 6: Tsunami



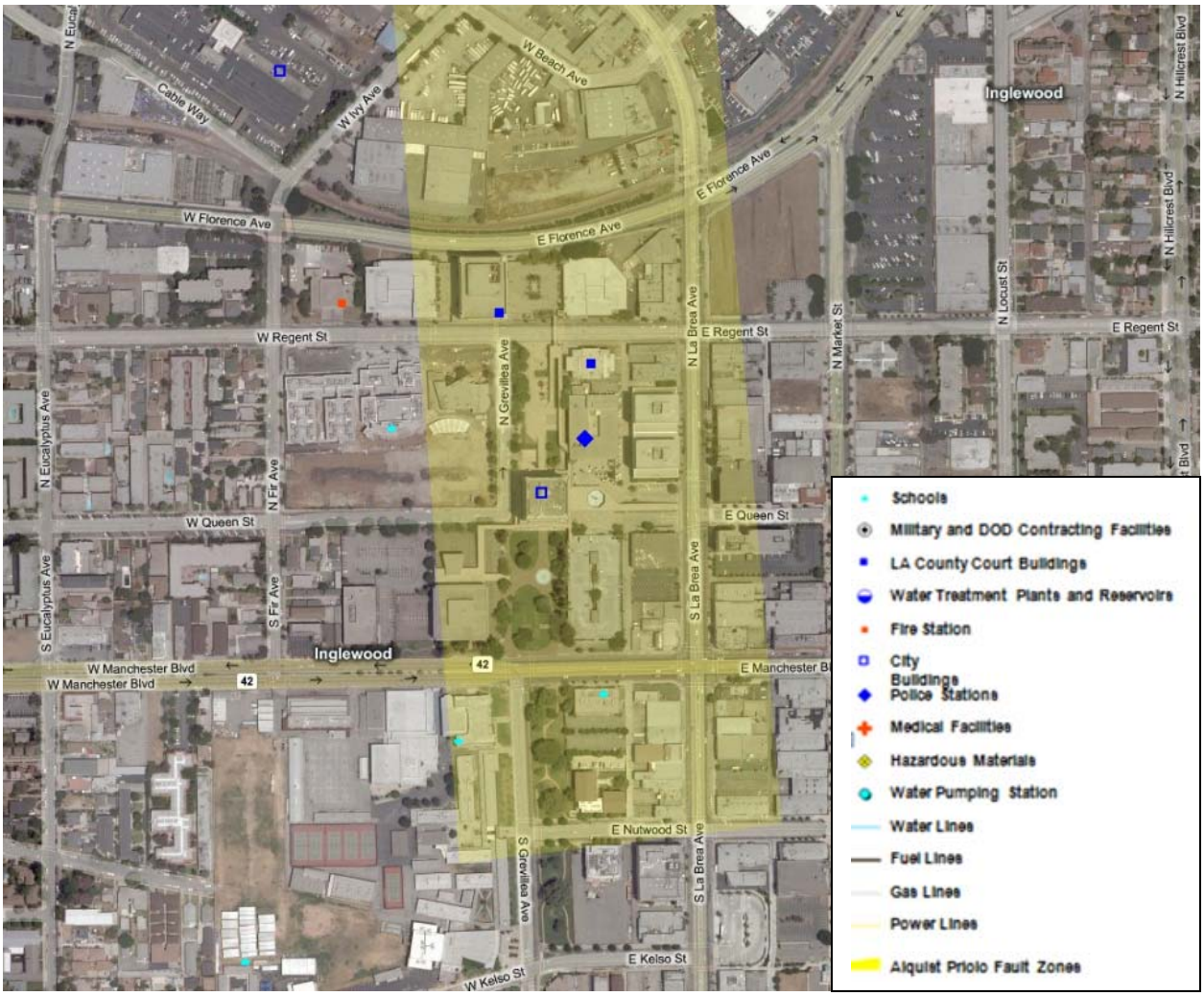
Map 7: Wildfire



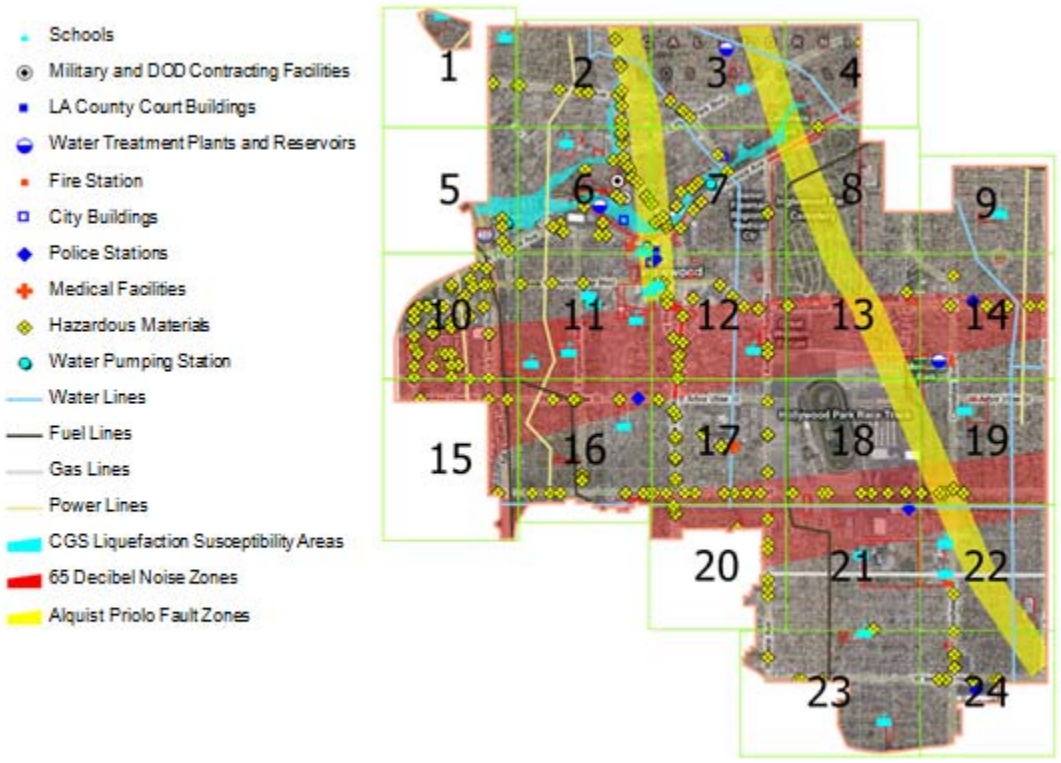
Map 8: Major Facilities, Lifelines, and PGA in Inglewood for a 6.9 on the Newport Inglewood Fault



Map 9: Newport- Inglewood zone located in close proximity to City Hall and other facilities in Inglewood



Map 10: Major Facilities, Lifelines, and Hazards in Inglewood

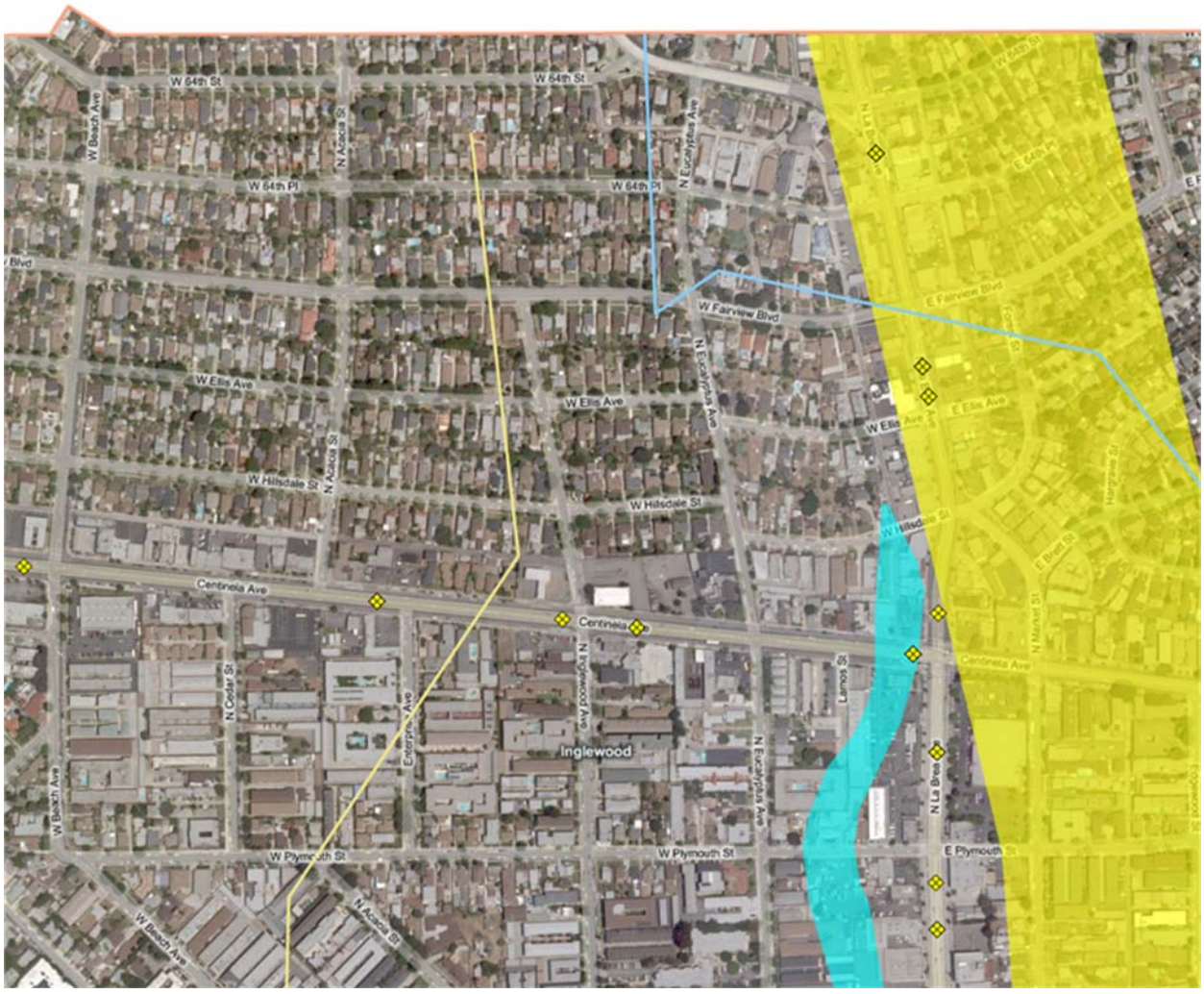


Area #1


W Goldenwood Dr
S Copperwood Ave
W Amberwood Dr
S Lemonwood Ave


N La Tijera Blvd
W 64th
S La Tijera Blvd
W Ellis Ave
W Hillsdale St
Centinela Ave
Short St
Evergreen St
Inglewood

Area #2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W 64th Pl
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W Fairview Blvd
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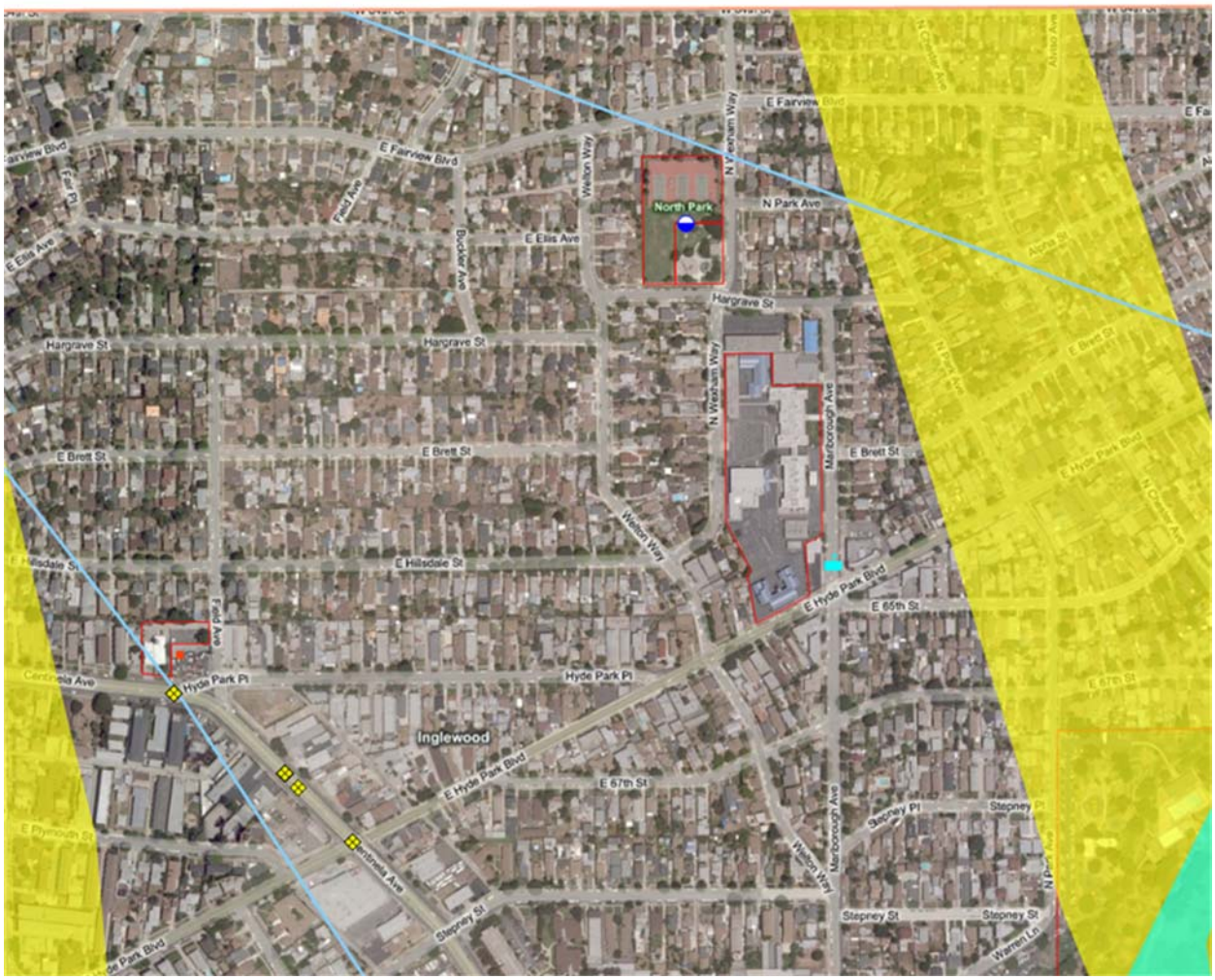
W Ellis Ave
E Ellis Ave
W Hillsdale St
E Hillsdale St
Centinela Ave
N Cedar St
N Inglewood Ave
Inglewood
Lamos St
N Market St
E Brent St
W Plymouth St
E Plymouth St

Area #3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N Wenham Way
North Park
N Park Ave
E Ellis Ave
Buckler Ave
Hargrave St
N Wenham Way
E Brett St
Marlborough Ave
E Hyde Park Blvd
E Hillsdale St
Weldon Way
Field Ave
E 65th St
Hyde Park Pl
Inglewood
E 67th St
Stepney Pl
Stepney St
Warren Ln

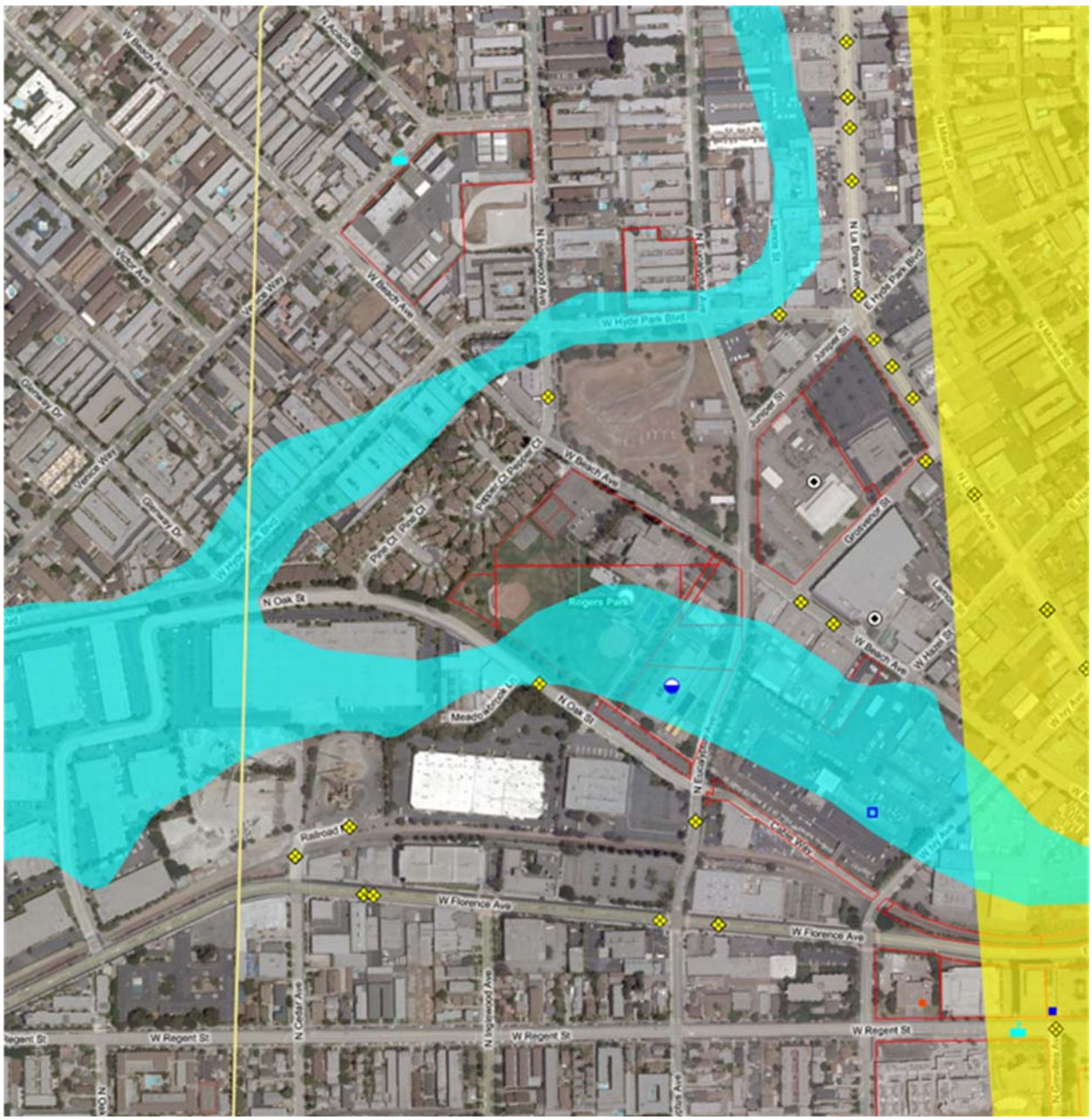
Area #4


E Fairview Blvd
E Hyde Park Blvd
E Brett St
Long St
Gage St
E 65th St
E 66th St
E 67th St
E 68th St
E 69th St
E 87th St
Inglewood
Hoge St
E Redondo Blvd
E Florence Ave
Centinela Park

Area #5


Hill St
Harbor Dr
Gateway Dr
Kirk St
Culver Blvd
Aviation Blvd
Venice Way
W Hyde Park Blvd
Imperial Hwy
San Diego Fwy
Vista St
Hyde Park Blvd
S La Cienega Blvd
Inglewood
Augusta St
W Florence Ave

Area #6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Vista Ave
Vista Way
Glenway Dr
Glenway Dr
Vanica Way
W Hyde Park Blvd
N Inglewood Ave
N La Brea Ave
E Hyde Park Blvd
Juniper St
Juniper St
Pepper Ct
Pepper Ct
Peal Ct
Peal Ct
W Beach Ave
Grosvenor St
N Oak St
Rogers Park
W Beach Ave
W Hazel St
Meadowbrook Ln
N Oak St
N Beach Ave
Railroad
W Florence Ave
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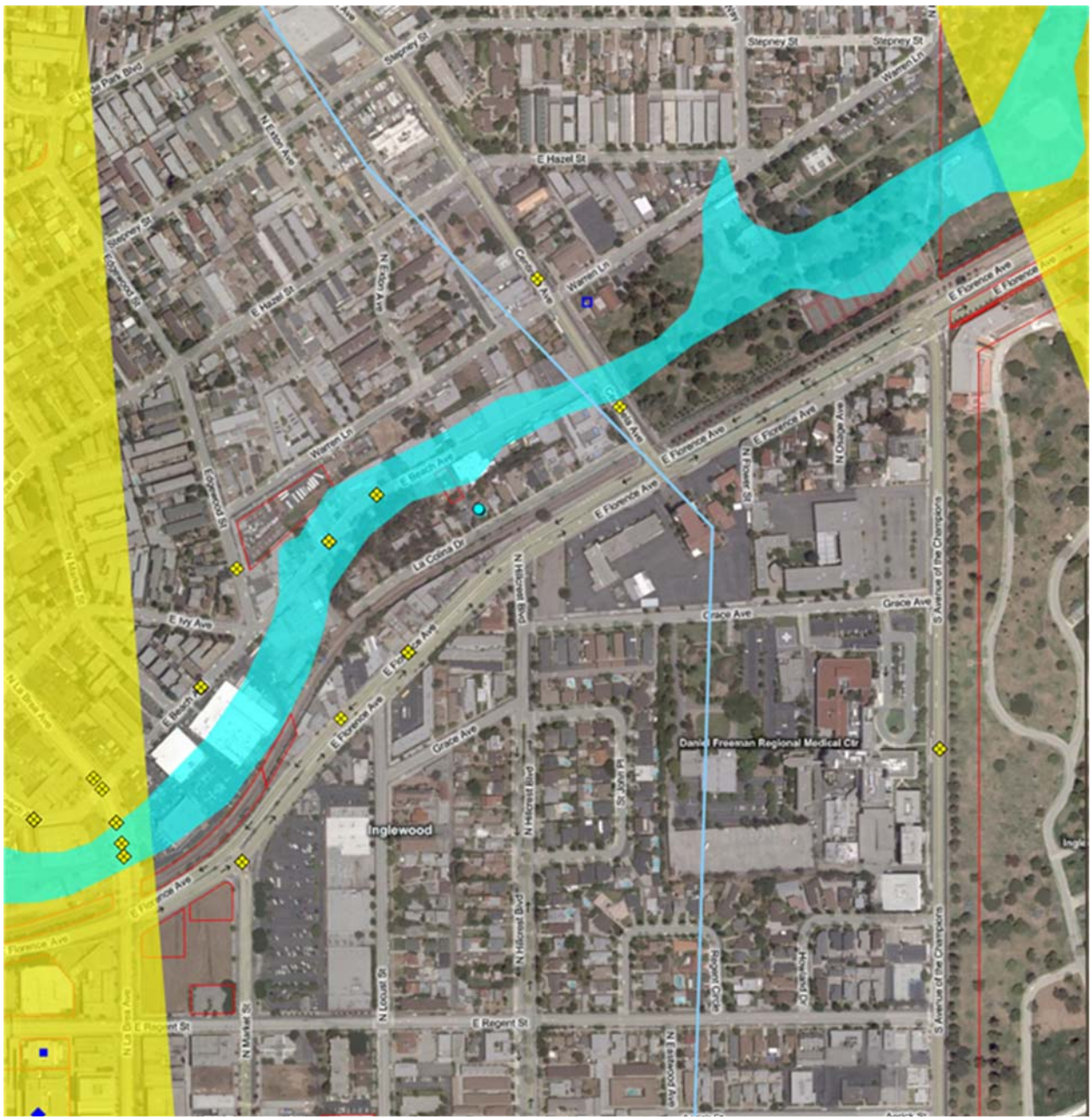
N Cedar Ave
N Inglewood Ave
W Regent St
W Regent St
W Regent St

Area #7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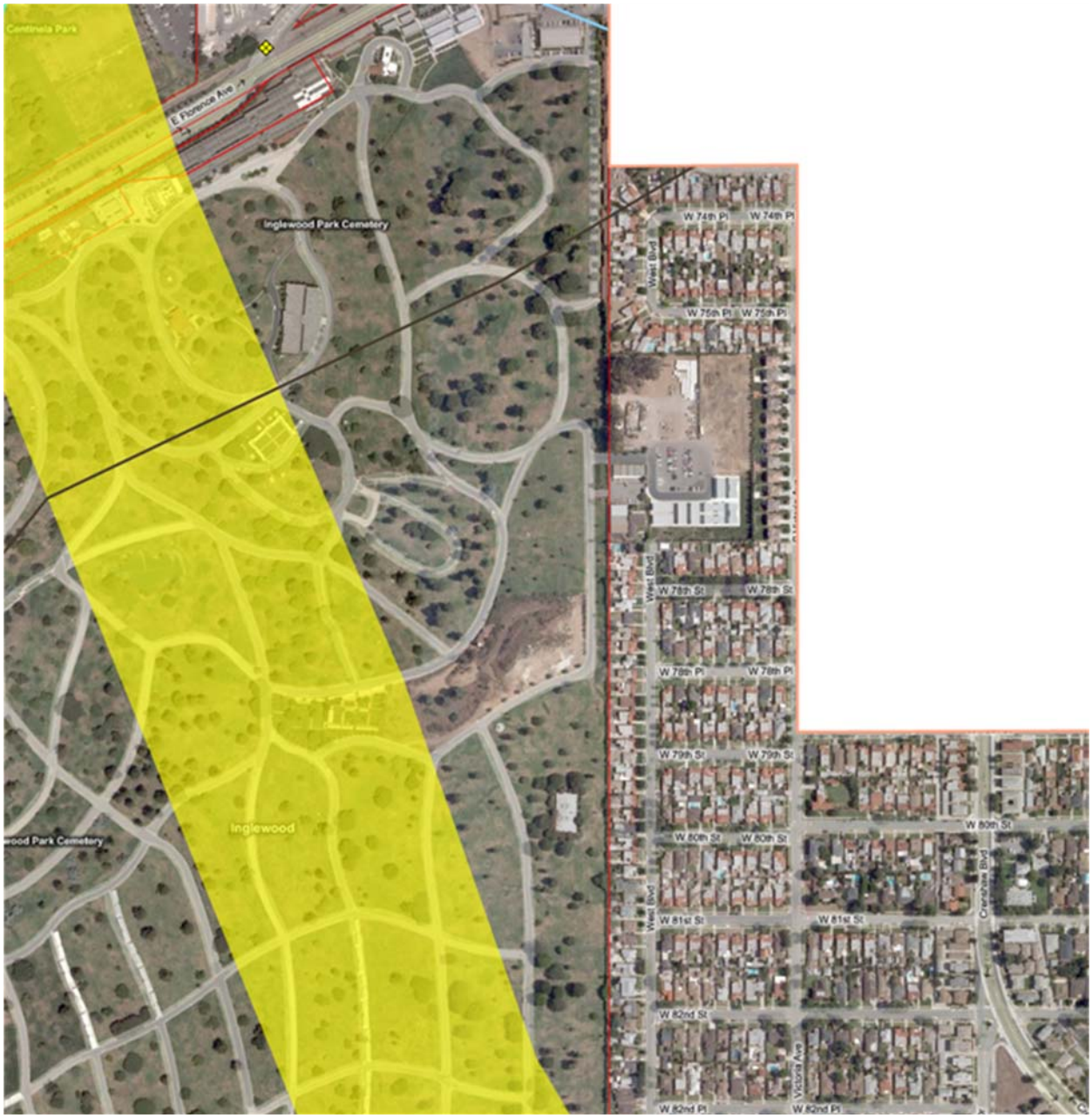
E Hazel St
Warren Ln
E Florence Ave
N Eucalyptus Ave
N Eaton Ave
N Osage Ave
N Flower St
Edgewood St
E Beach Ave
La Colina Dr
N Hillcrest Blvd
Grace Ave
S Avenue of the Champions
Daniel Freeman Regional Medical Ctr
Inglewood
N Locust St
E Regent St
N Market St
Regent Cir
Howard Dr
N Kenwood Ave
N La Brea Ave
Florence Ave

Area #8


Centinela Park
E Florence Ave
Inglewood Park Cemetery
Inglewood
W 74th Pl
W 75th Pl
West Blvd
W 78th St
W 78th Pl
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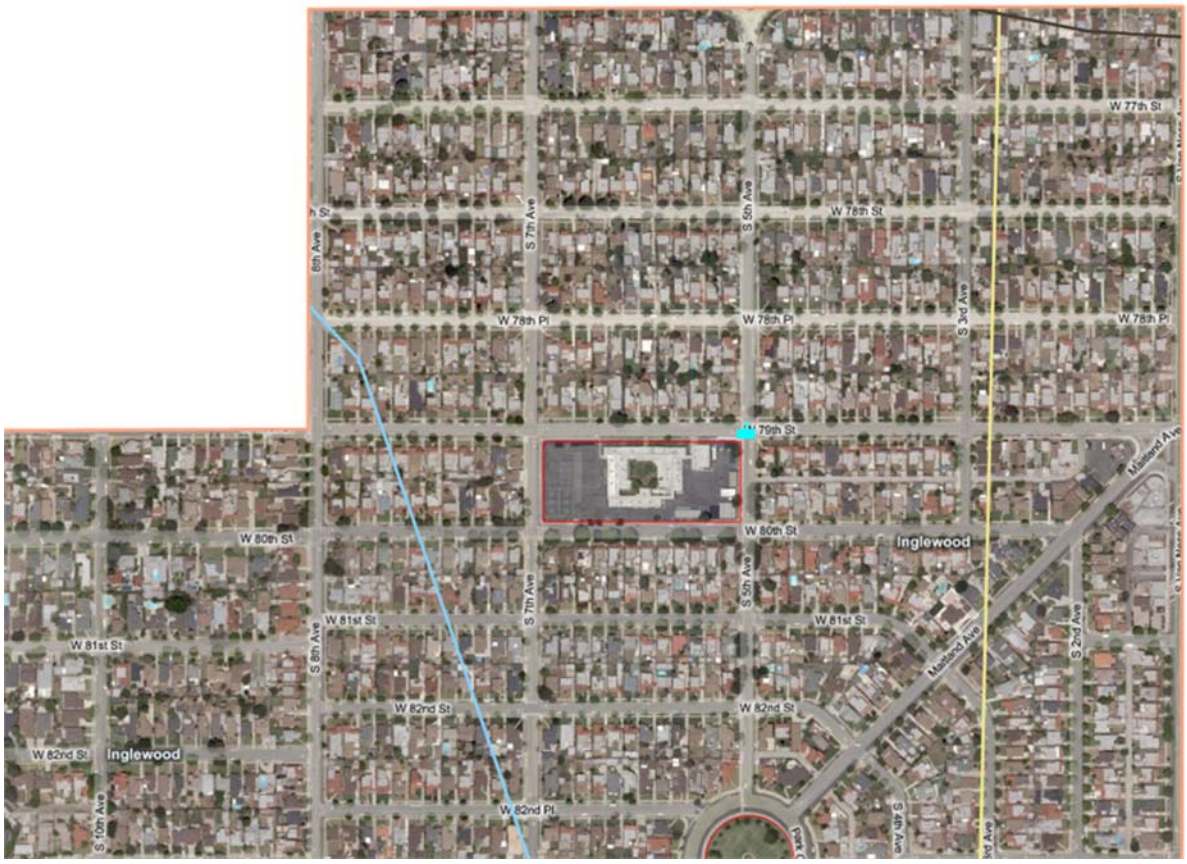
W 80th St
W 81st St
W 82nd St
W 82nd Pl
Victoria Ave
Crenshaw Blvd

Area #9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W 82nd St
W 82nd Pl
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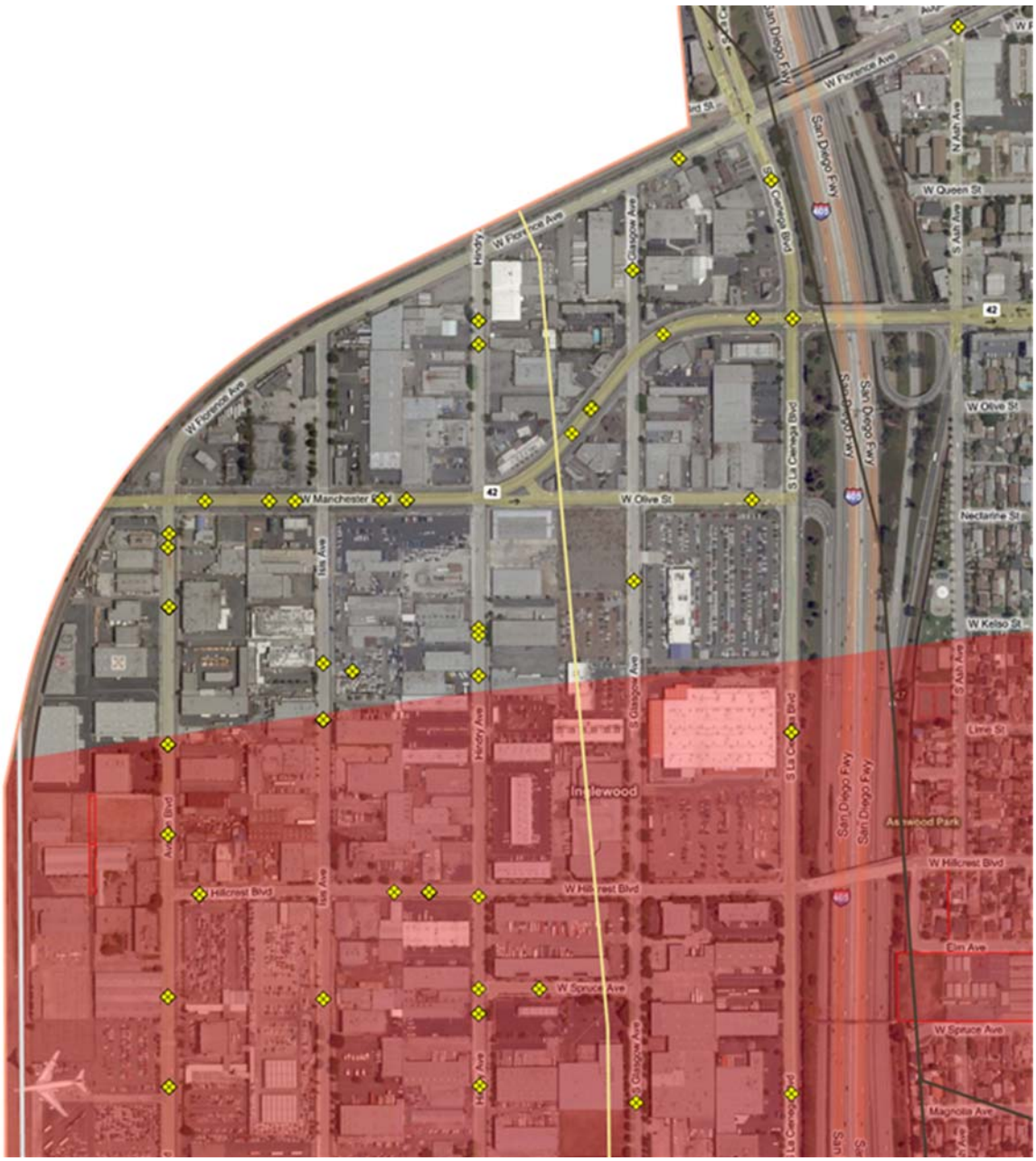
S 5th Ave
S 3rd Ave
S 2nd Ave
S 8th Ave
S 10th Ave
Maitland Ave
Inglewood

Area #10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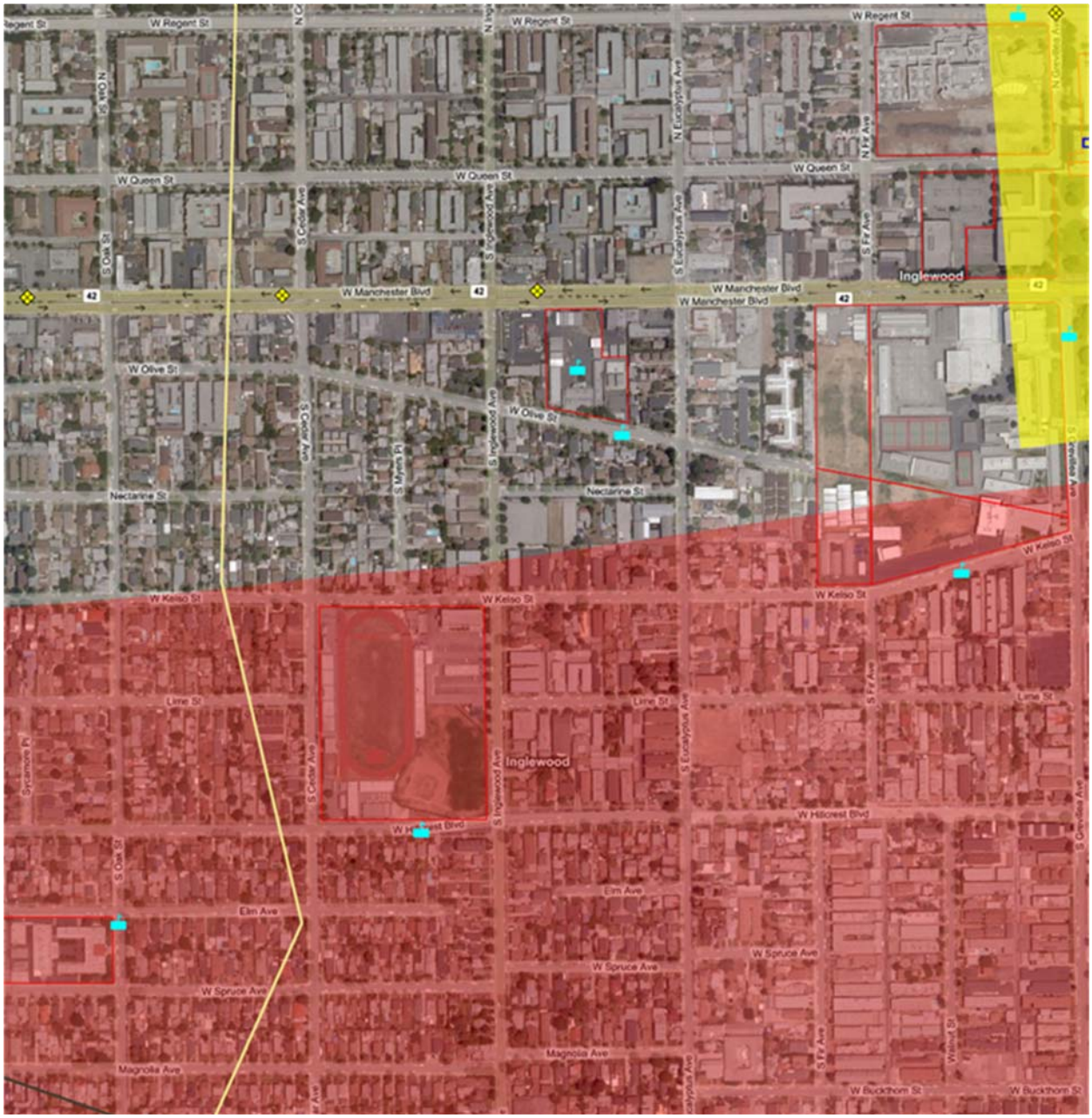
San Diego Fwy
W Queen St
W Olive St
W Manchester
Nectarine St
W Kelso St
Lime St
Inglewood
Hillcrest Blvd
W Spruce Ave
Elm Ave
Magnolia Ave

Area #11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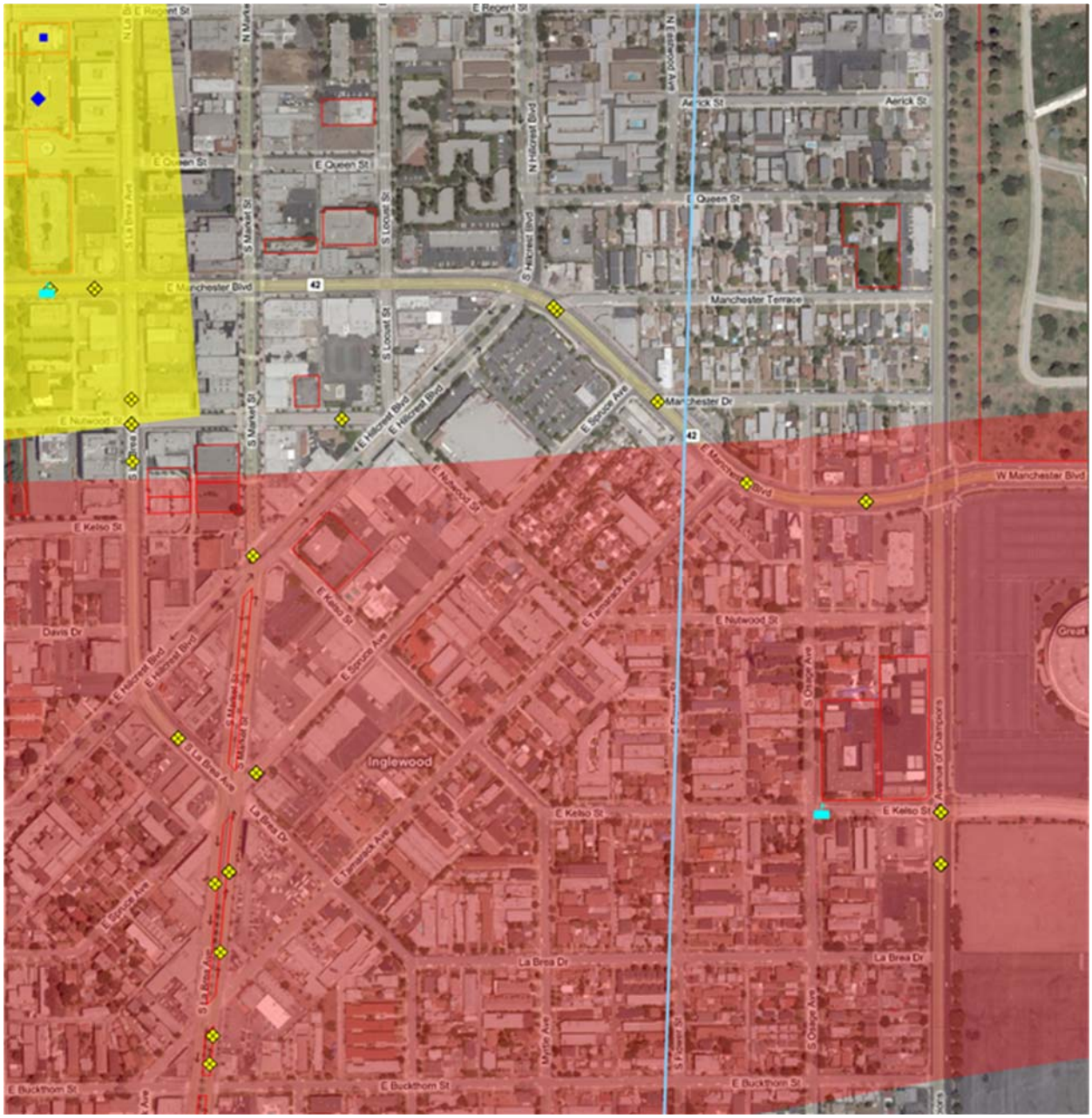
W Manchester Blvd
W Olive St
Nectarine St
W Kelso St
Lime St
W Hillcrest Blvd
Elm Ave
W Spruce Ave
Magnolia Ave
W Buckthorn St
Inglewood
S Oak St
S Cedar Ave
S Inglewood Ave
S Myers Pl
S Eucalyptus Ave
S Fir Ave
N Eucalyptus Ave
N Fir Ave
Sycamore Pl
Walnut St
42

Area #12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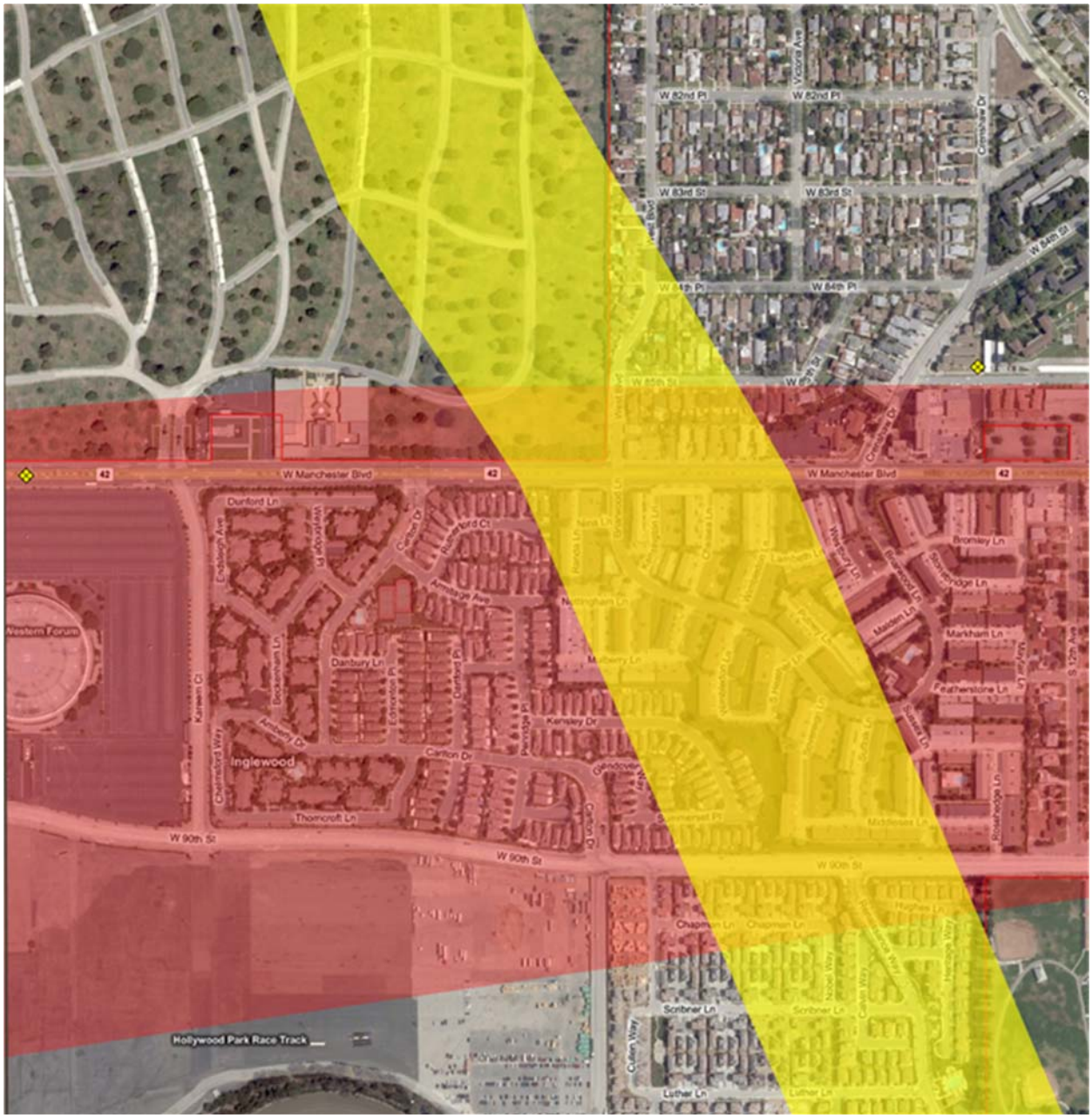
E Queen St
E Manchester Blvd
Manchester Terrace
E Nutwood St
E Kelso St
Davis Dr
La Brea Dr
E Buckthorn St
Inglewood
W Manchester Blvd
Aerick St
N Hillcrest Blvd
S Hillcrest Blvd
S Market St
S Locust St
S La Brea Ave
E Spruce Ave
E Tamarack Ave
S Osage Ave
Avenue of Champions
42

Area #13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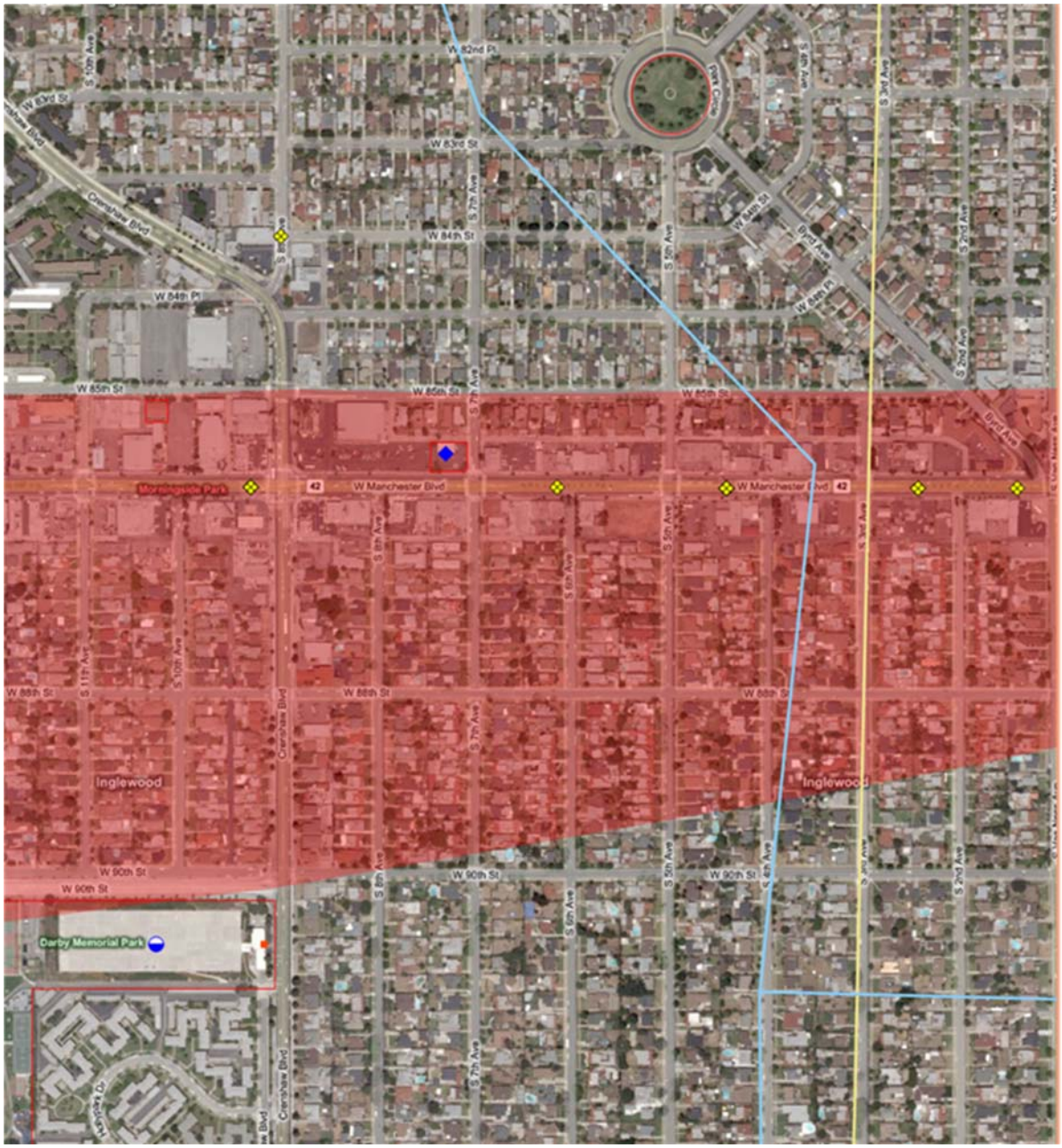
W 90th St
Inglewood
Hollywood Park Race Track
W 82nd Pl
W 83rd St
W 84th Pl
Dunford Ln
Thorncroft Ln
Kensley Dr
Carlton Dr
Scribner Ln
Luther Ln
Markham Ln
Featherstone Ln
Bromley Ln

Area #14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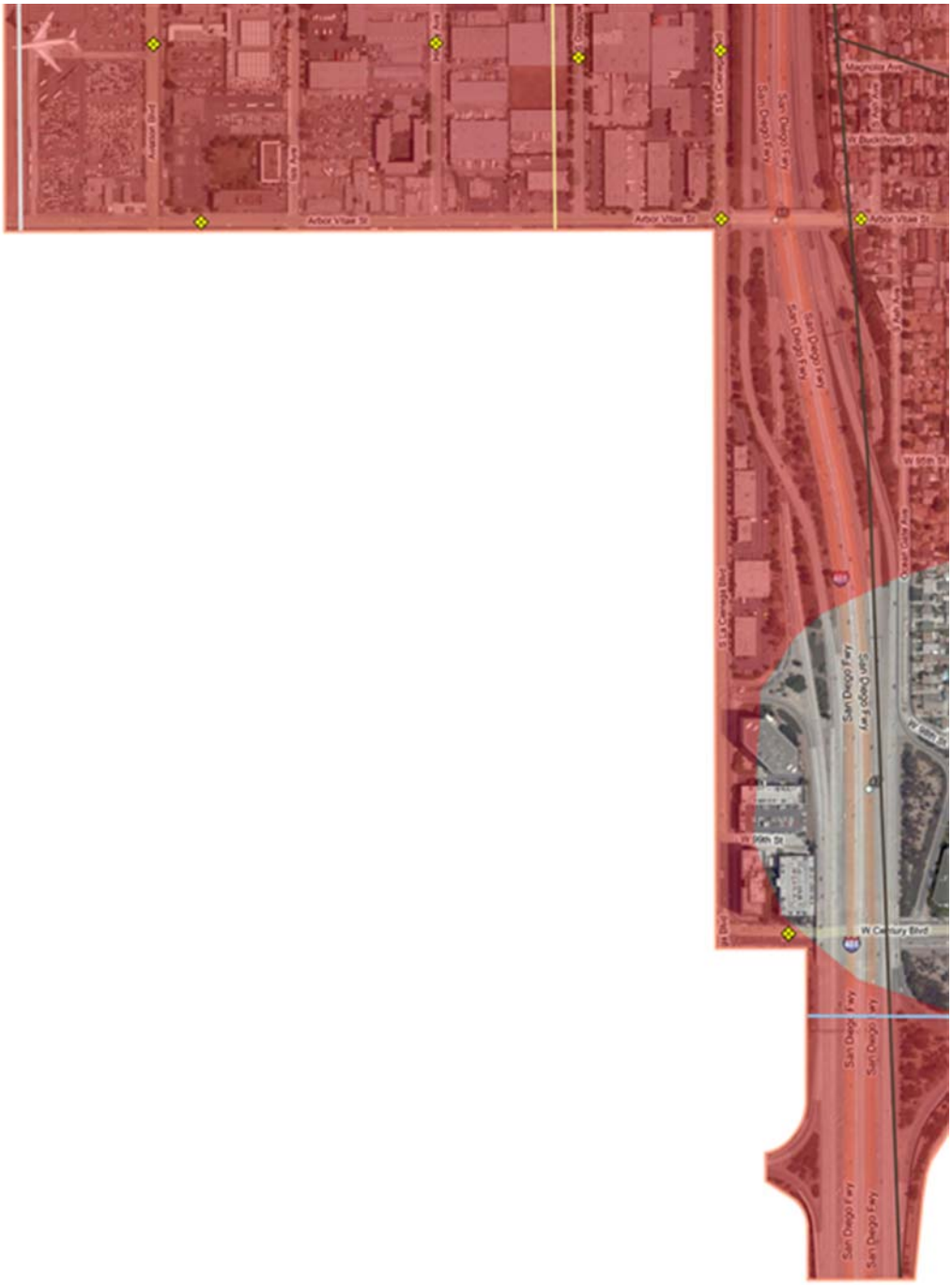
W 88th St
W 90th St
W Manchester Blvd
Crenshaw Blvd
S 3rd Ave
S 2nd Ave
S 5th Ave
S 6th Ave
S 7th Ave
S 8th Ave
S 10th Ave
Inglewood
Darby Memorial Park

Area #15



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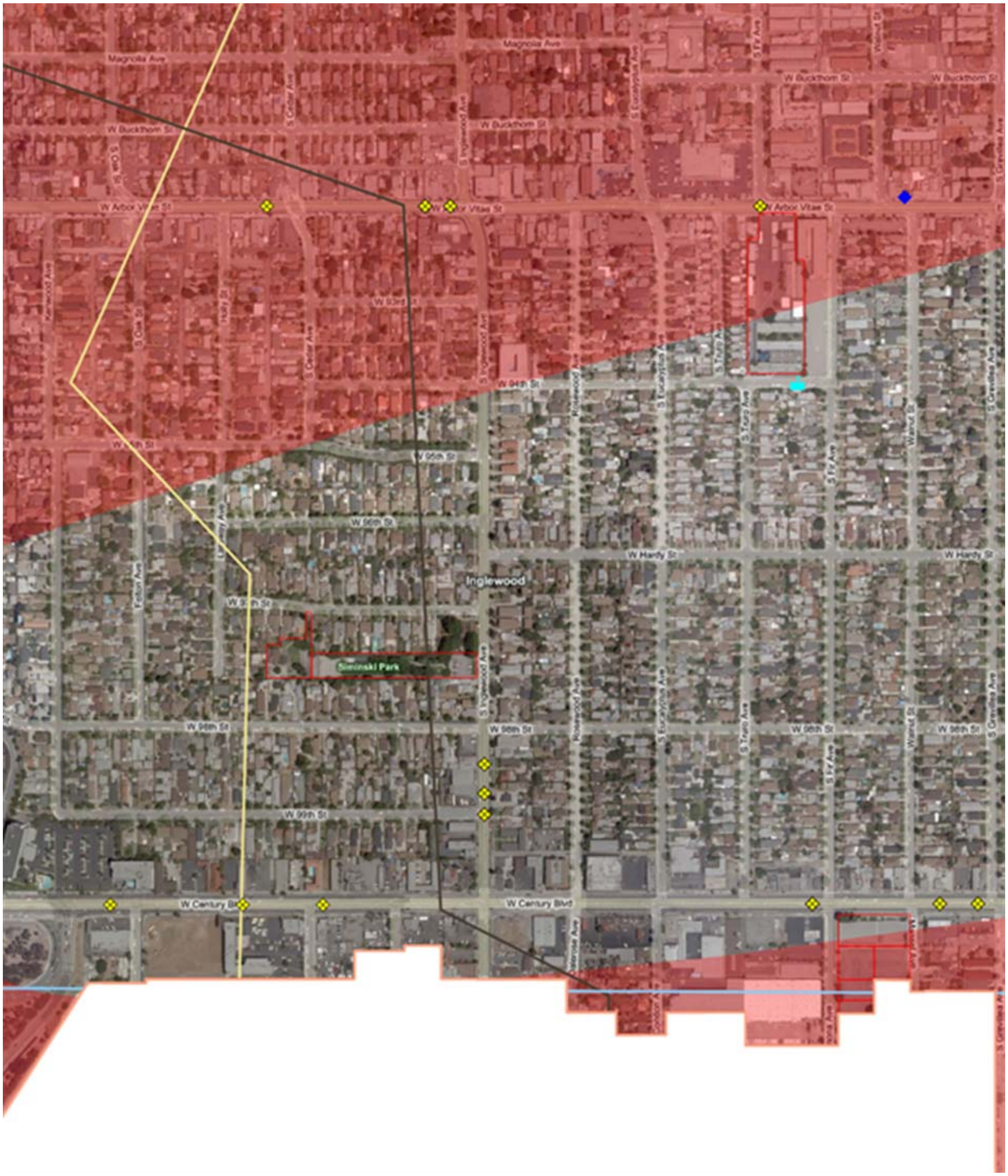
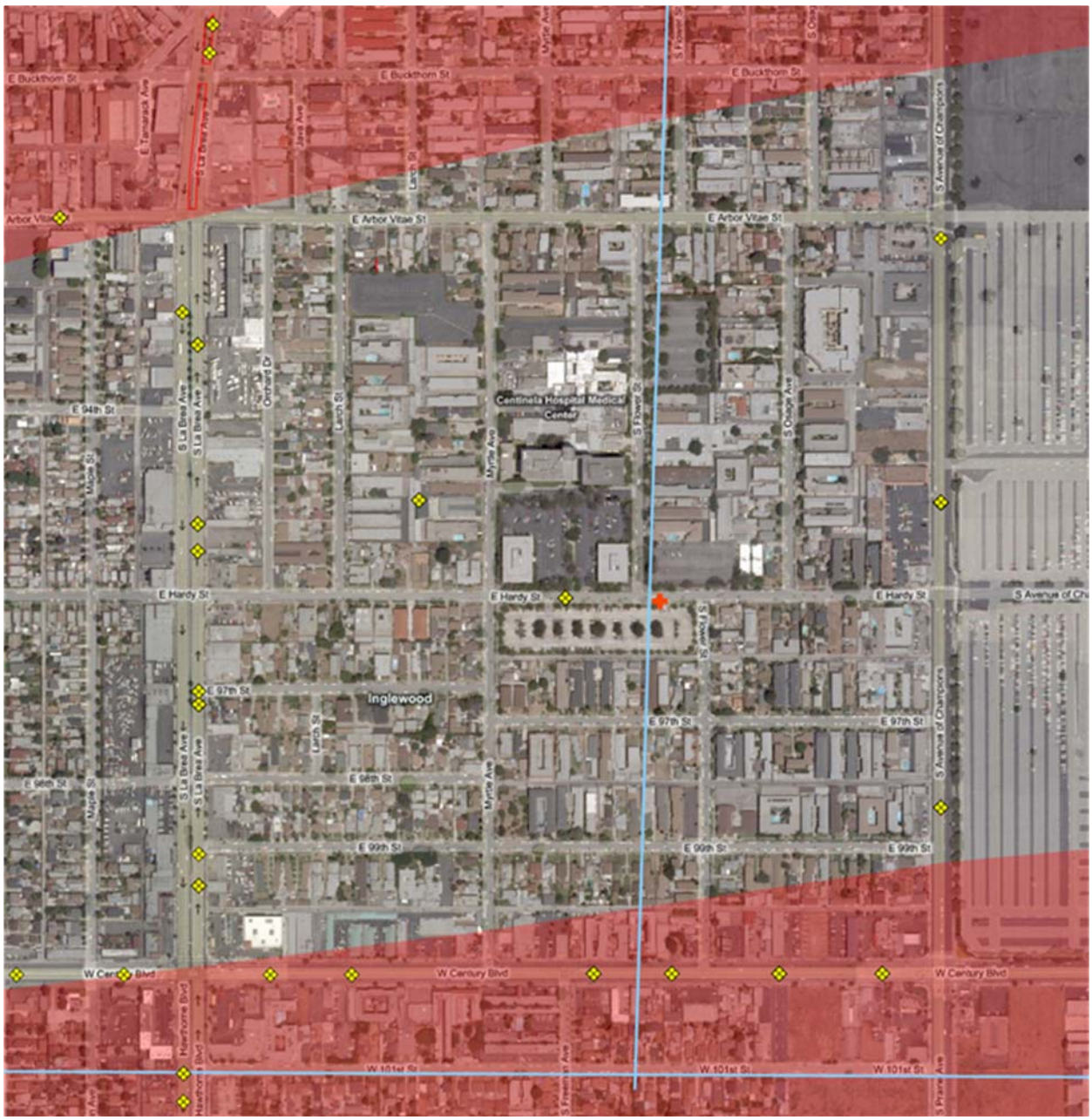


Magnolia Ave
W Buckthorn St
W Arbor Vitae St
W 94th St
W 95th St
W 96th St
W Hardy St
Inglewood
W 98th St
W 99th St
W Century Blvd

Area #17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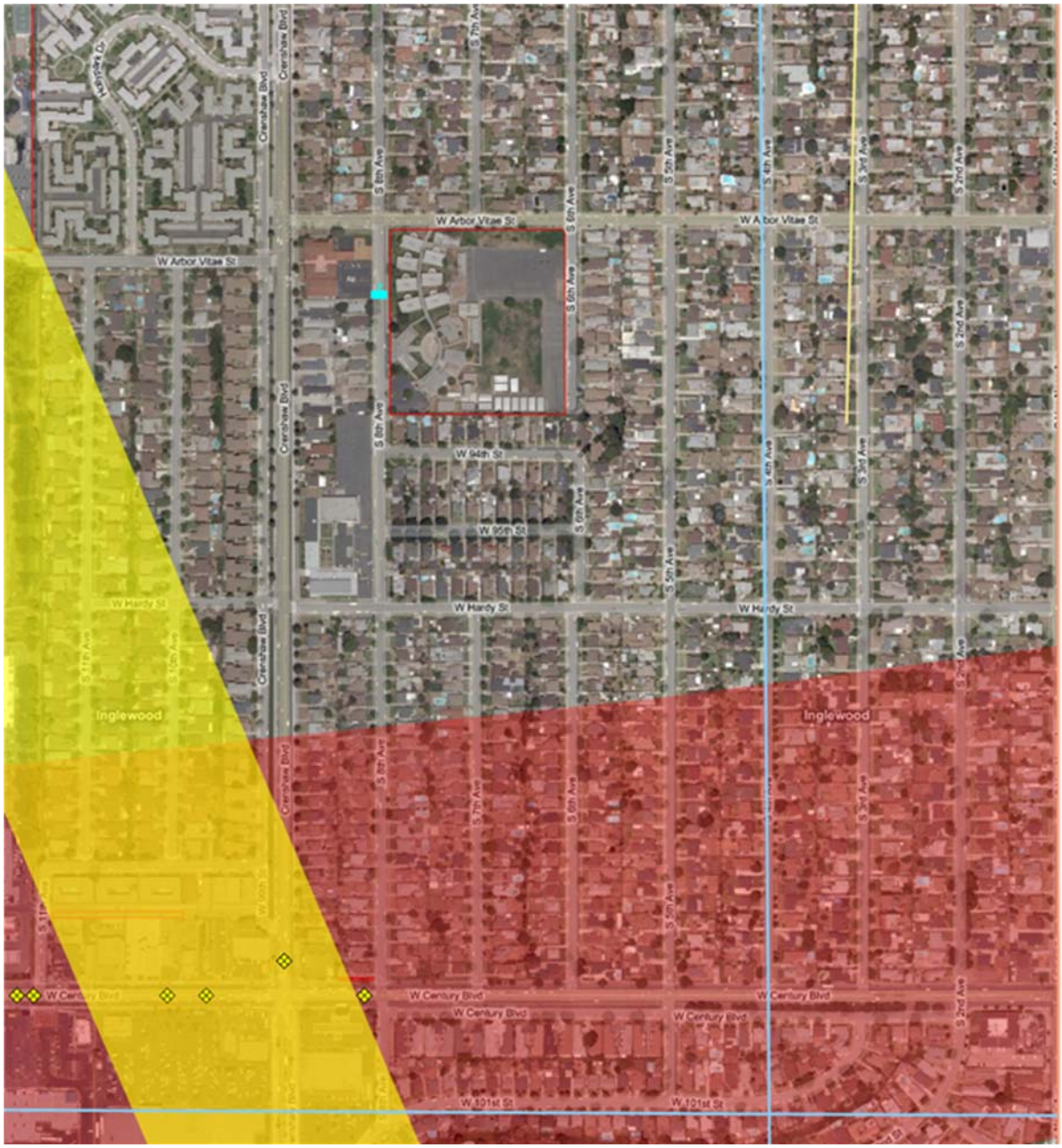
E Arbor Vitae St
E 94th St
E Hardy St
E 97th St
E 98th St
E 99th St
W Century Blvd
W 101st St
Inglewood
Centinela Hospital Medical Center
S La Brea Ave
Myrtle Ave
Larch St
Orchard Dr
Maple St
S Flower St
S Avenue of Champions
Hawthorne Blvd

Area #18


Hollywood Park Race Track
Luther Ln
Medici Ln
Medici Ln
Hollywood Park Race Track
Hollywood Park Race Track
Inglewood
W Century Blvd
W Century Blvd

Area #19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Crenshaw Blvd
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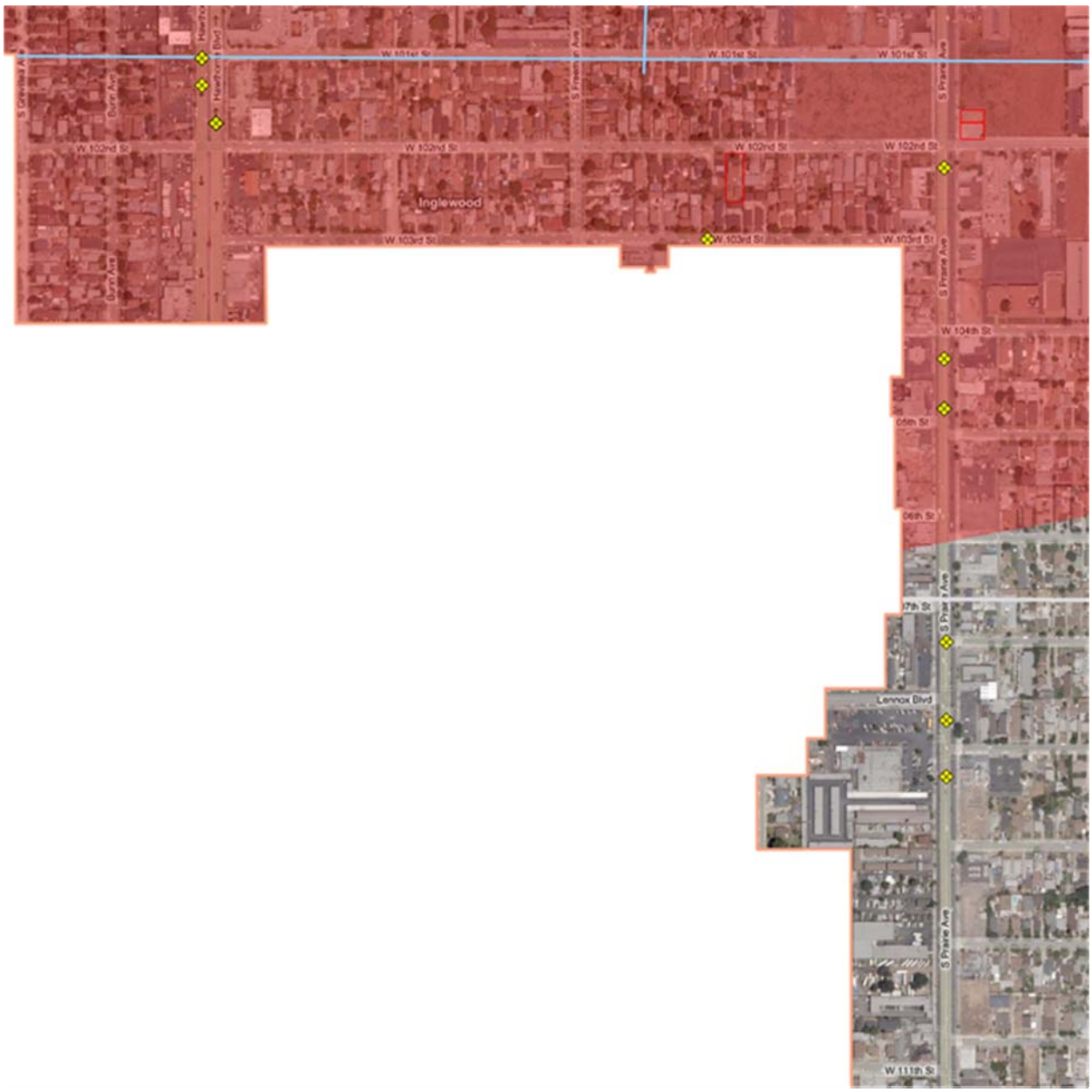
S 2nd Ave
Inglewood

Area #20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W 102nd St
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Inglewood
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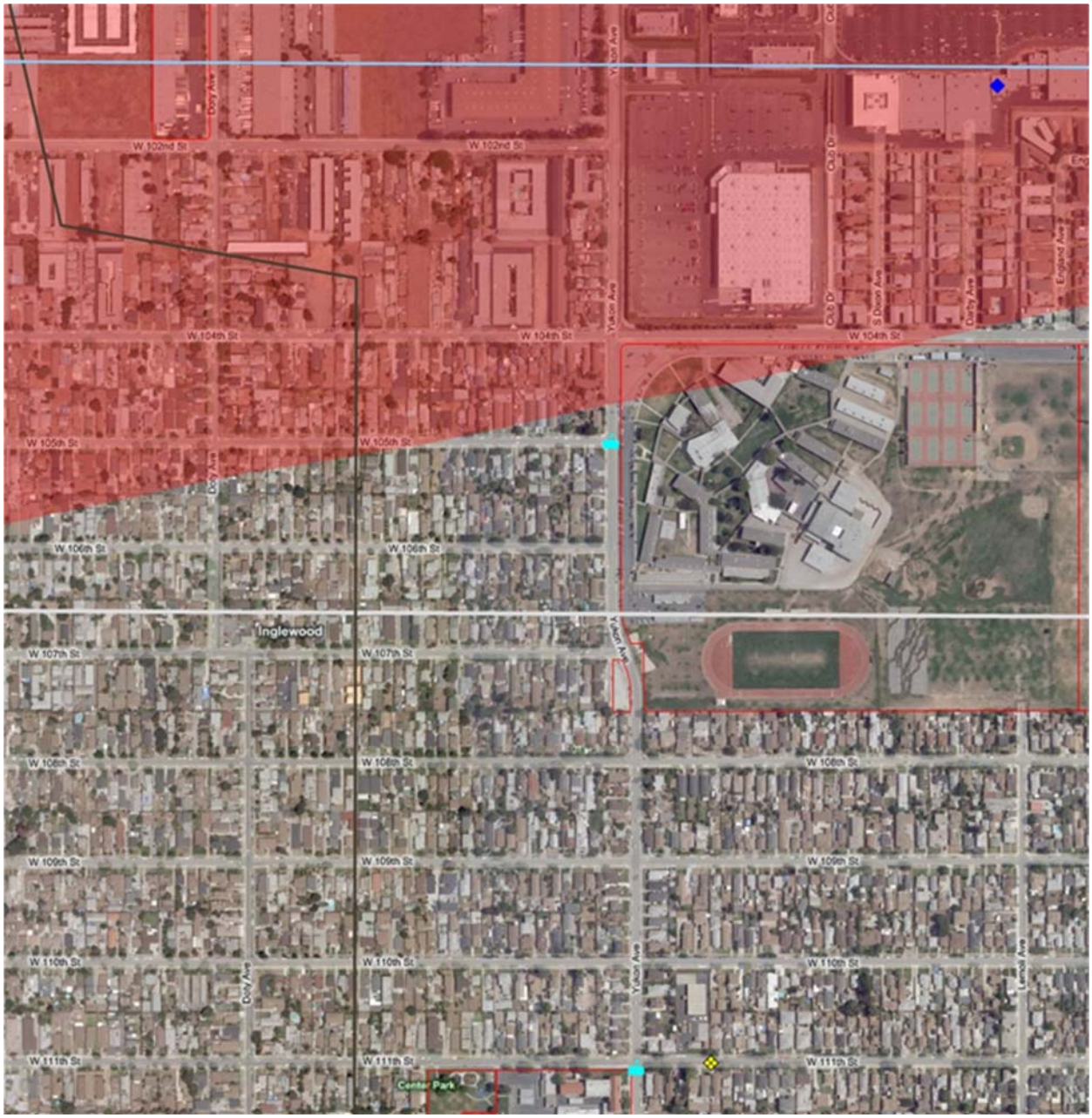
W 104th St
Lennox Blvd
W 111th St

Area #21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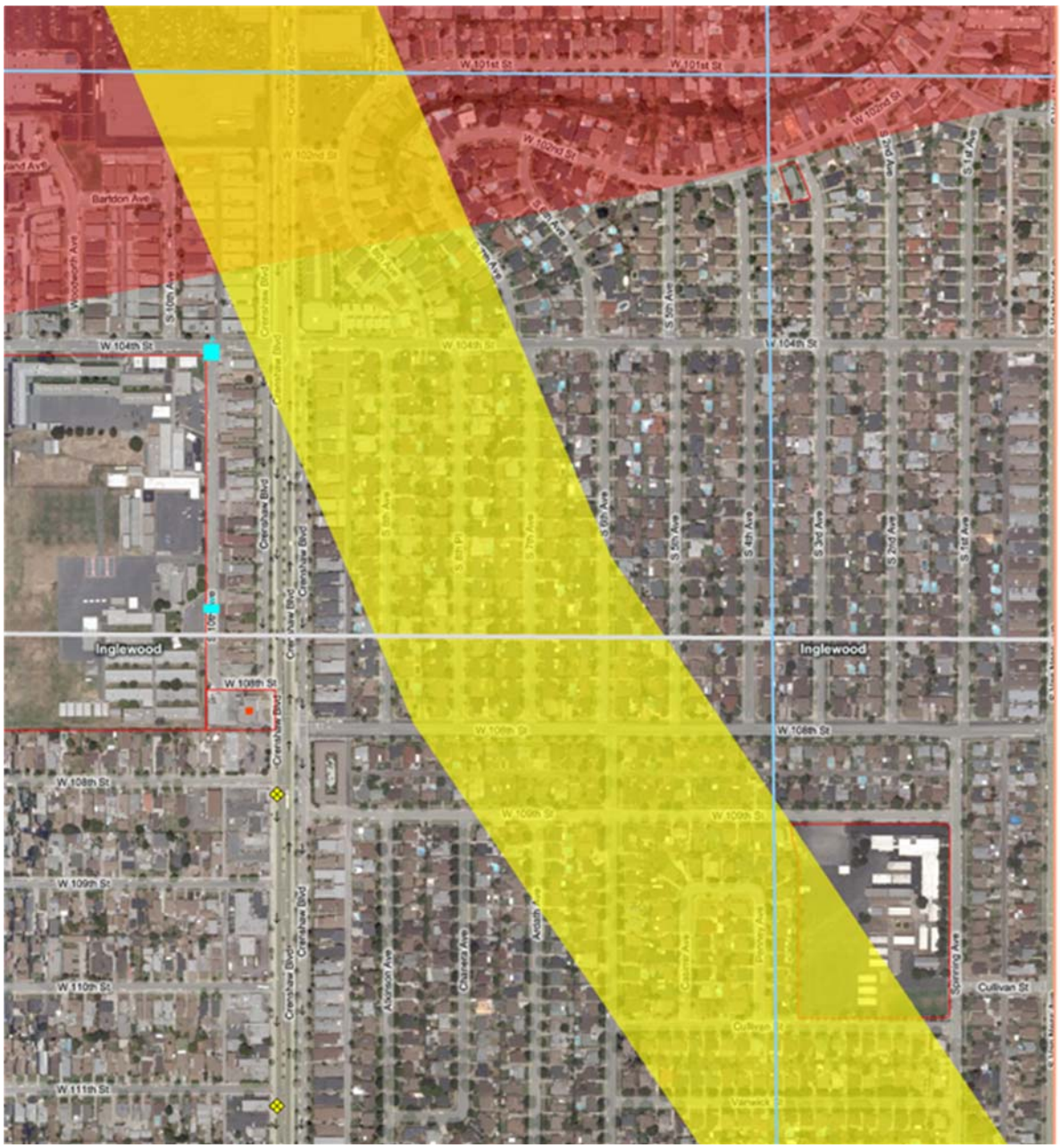
W 105th St
W 106th St
Inglewood
W 107th St
W 108th St
W 109th St
W 110th St
W 111th St
Yukon Ave
Doty Ave
Crenshaw Blvd
Lemoli Ave
Center Park

Area #22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W 102nd St
Barlow Ave
Woodworth Ave
S 6th Ave
W 104th St
Crenshaw Blvd
S 5th Ave
S 4th Ave
S 3rd Ave
S 2nd Ave
S 1st Ave
Inglewood
W 108th St
W 108th Pl
W 109th St
W 109th Pl
W 110th St
W 111th St
Aviation Ave
Osage Ave
Spring Ave
Cullivan St

Area #23


W 111th St
Center Park
W 111th Pl
W 112th St
W 113th St
W Imperial Hwy
W 115th St
W 116th St
W 117th St
W 117th Pl
W 118th St
W 118th Pl
Doty Ave
Yukon Ave
Cherry Ave
Dehn Ave
Lemoli Ave

Appendix E: Review of Inglewood Seismic Evaluation

Seismic evaluation of the City Service Center located at 222 West Beach Avenue, Inglewood and City Hall located at One Manchester Boulevard, Inglewood

A seismic evaluation of the City Center facility and the City Hall was performed by adopting ASCE/SEI criteria (see complete reports in Appendix E-1 and E-2). The intent of the evaluation was to ensure that both the buildings meet the level of performance required to safeguard against major structural failure or loss of life. It was also to determine the need (2001 California Building Code and FEMA requirements) of seismic retrofit of structural members of the lateral force resisting systems. The evaluation concluded that the risk to life safety in both the buildings is low.

The city center building is a collection of three separate structures- Phase I, which is a 3-story employee building, Phase II, composed of 3 sections, and a central building connected to Phase I building. The evaluation found inadequacies in several of the structural elements of the building which did not meet the acceptance criteria (ASCE/ SEI 31-03). These included poorly distributed or lightly reinforced shear walls, wall reinforcements, and deteriorated diaphragms. The report provided retrofit recommendations for all these elements to ensure life safety levels of building performance.

The city hall is a 9-story reinforced concrete building with a penthouse and a subterranean parking. There is a partial level which is not located below the tower and serves as the emergency operations room. Most of the structural elements of the city hall including frame beams, shear walls, diaphragms, and foundation meet the acceptance criteria of ASCE/SEI 31-03. Most of the frame columns with the exception of some (identified in the report) meet the acceptance criteria. Recommendations have been provided for the frame columns that need retrofit.

Chemical release and dispersion analysis for the Sanford M. Anderson Water Treatment Plant

Plume modeling was performed for a worst case scenario and two additional scenarios. (see complete report in Appendix E-3) of the three scenarios considered the following factors: i. release quantity, ii. release rate, iii. topology, and iv. meteorological characteristics of the site. A summary of the dispersion analysis is presented in Table 1. The distance to the toxic endpoint was estimated for each scenario and the number of people exposed to chlorine gas was identified (Table 2). Several sensitive population centers (Table 3), such as, schools, parks, and senior centers were identified within a 0.5 mile radius of the water treatment plant facility. These fell within the zone with the potential of being exposed to toxic chlorine gas in the event of a chemical release due to an earthquake or other incidents.

Parameter	Worst-Case	ALT-1	ALT-2
Materials Released	Chlorine	Chlorine	Chlorine
Type of Material (liquid/gas/liquid under pressure/refrigerated liquid	Liquid under pressure	Liquid under pressure	Liquid under pressure
Release Quantity (lb.)	2,000	2,000	2,000
Type of Release (liquid/gas)	Liquid	Liquid	Liquid
Release Rate to Outside Air (lb./m)	110	82.5	10
Release Time	10 minutes	Until empty	Until Empty
Release Direction	Vertical	Vertical	Horizontal
Release Temperature (°F)	77	77	77
Release Pressure(atm)	1	1	1
Height of release (ft) / (m)	0 / 0	8 / 2.4	0 / 0
Ambient Temperature (°F)	77	77	77
Ambient Pressure (atm)	1	1	1
Relative Humidity	50%	50%	50%
Stability Class	F	D	D
Wind Speed (m/s)	1.5	3.0	3.0
Surface Roughness	Urban	Urban	Urban
Averaging Time (minute)	N.A.	N.A.	N.A.
Type of gas (dense/neutrally buoyant)	Dense	Dense	Dense
Toxic Endpoint Concent. (ppm) / (mg/l)	3 / 0.0087	3 / 0.0087	3 / 0.0087
Distance to Toxic Endpoint (mile) / (km)	0.9 / 1.4	0.2 / 0.3	0.1 / 0.2

Table E-1: Dispersion Analysis Summary

Scenario	Distance to Toxic Endpoint	Residential Population within the Circle
Worst Case Release	0.9 miles	37,940
ALT-1: Fuse plug leak inside the building	0.2 miles	583
ALT-2: Valve leak outside the building	0.1 mile	1

Table E-2: Estimated Population Data

Population Receptor	Telephone Number	Address	Type	Distance to Release Point
Hudnall Elementary School	(310) 680-5420	331 W Olive St	School	0.4
Highland Elementary School	(310) 680-5460	430 Venice Way	School	0.4
La Tijera Elementary School	(310) 680-5260	1415 N La Tijera Blvd	School	0.5
Inglewood High School	(310) 680-5200	231 S Grevillea Ave	School	0.4
George W. Crozier Middle School	(310) 680-5280	151 N Grevillea Ave	School	0.3
Training Research Foundation	(310) 677-4711	323 S Eucalyptus Ave	Preschool	0.4
First Lutheran Pre-School	(310) 674-0310	600 W Queen St	Preschool	0.4
Village Preschool	(310) 680-9922	434 S Grevilllea Ave	Preschool	0.5
Training Research Foundation	(310) 677-6018	400 W Beach Ave	Daycare	0.2
Jordan Day Care	(310) 412-2060	200 W Queen St	Daycare	0.2
Inglewood Avenue Preschool	(310) 674-5011	215 S Inglewood Ave	Daycare	0.3
Kid’s Castle Child Care Center	(310) 677-2997	745 N La Brea Ave	Daycare	0.4
Sunshine Day Care Center	(310) 680-9717	504 Edgewood St	Daycare	0.5
Youth & Family Center Infant	(310) 671-6719	401 S Inglewood Ave	Daycare	0.5
Village Preschool	(310) 680-9922	434 S Grevillea Ave	Daycare	0.5
Westchester Villa Retirement	(310) 673-1093	220 W Manchester Blvd	Long Term Health	0.3

Population Receptor	Telephone Number	Address	Type	Distance to Release Point
Eucalyptus Park Apartments	(310) 677-7482	811 N Eucalyptus Ave	Long Term Health	0.4
Wells Guest Home	(310) 412-1886	111 S Oak St	Long Term Health	0.4
Regency Towers	(310) 677-5400	151 N Locust St	Long Term Health	0.5
Inglewood Meadows	(310) 672-3988	1 S Locust St	Long Term Health	0.5
Rogers Park	(310) 412-5504	400 W Beach Ave	Park	0.1
Inglewood Recreation Park	(310) 412-5483	1 W Manchester Blvd	Park	0.3

Table E-3: Sensitive Population Receptors within 0.5-Mile Radius

Appendix E-1: Inglewood City Hall Seismic Evaluation

Professional Engineering Center
2750 S. Harbor BLVD, Suite K, Santa Ana, CA 92704
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www.structuralec.com

July 8, 2008

Mr. Glen W. C. Kau, PE
Public Works Director
Public Works Department, City of Inglewood
One Manchester Boulevard
Inglewood, California 90312

Regarding: City Hall Seismic Evaluation, City of Inglewood, California

Dear Mr. Kau:

As indicated in the Scope of Work of the Professional Services Proposal from Professional Engineering Center to the Public Works Department, City of Inglewood, dated July 26, 2006, we are submitting our seismic evaluation report.

1.0 GENERAL BACKGROUND

The Public Works Department at the City of Inglewood requested seismic evaluation of the City Hall Building located at One Manchester Boulevard, Inglewood, California. The intent of the seismic evaluation as described by the Public Works Department is to ensure the life safety and determine the need for seismic retrofit of the structural members of the lateral force resisting system of the building if required according to the 2001 CBC code adopting the FEMA criteria. It has been clarified in a correspondence, dated October 2, 2006, from Professional Engineering Center to the Public Works Department at the City of Inglewood that the Life Safety Performance Level according to the FEMA 356 document constitutes buildings to experience extensive damage to structural and nonstructural components. Also, repairs may be required before reoccupancy of the building occurs, and repair may be deemed economically impractical. The risk to life safety in buildings meeting this target Building Performance Level is low.

2.0 SCOPE OF WORK

The scope of work includes the seismic evaluation of the City Hall Building located at One Manchester Boulevard, Inglewood, California. The seismic evaluation includes the following:

- Study the as-built structural drawings prepared by Johnson & Nielsen Associates Consulting Structural Engineers, Los Angeles, CA, January 1971.

- Provide site visits to confirm that the structural system of the City Hall building matches that as described in the as-built structural drawings and details.

- Conduct three-dimensional elastic dynamic analysis of the lateral force resisting system of the City Hall Building according to the FEMA 356 document.

- Evaluate the structural members of the lateral force resisting system according to the FEMA requirements considering the Life-Safety performance level.

- Develop an evaluation report that includes the following:

    - Seismic evaluation narrative describing the evaluation process and basis.

    - Description of the structural system based on the as-built drawings and the structural observation resulted from the site visits.

    - Evaluation process including modeling assumption, seismic hazard, three dimensional dynamic model and analysis description and results of the seismic evaluation of the structural members.

    - Evaluation of the lateral force resisting system based on the results of the analysis and the acceptance criteria by FEMA 356.

    - Identify structural members that need may need seismic retrofit, if any, and provide recommendations for seismic retrofit.

3.0 DOCUMENTS REVIEWED

We have reviewed to the extent necessary to develop our professional opinions the following documents related to the seismic evaluation of the City Hall Building. These documents included the as-built structural drawings prepared by Johnson & Nielsen Associates Consulting Structural Engineers, January 1971.

4.0 ADOPTED CODE AND ACCEPTANCE CRITERIA

The governing building code is the 2001 California Building Code. Chapter 16, Division VI-R, "Earthquake Evaluation and Design for Retrofit of Existing State-Owned Buildings". Method B of Division VI-R was selected for the evaluation.

The requirements set forth by FEMA 356 Document, "Prestandard and Commentary for the Seismic Rehabilitation of Buildings" were adopted. The Life Safety performance level was employed as the seismic performance criteria for the evaluation study.

5.0 SITE VISITS

Two site visits were conducted to confirm that the structural system of the City Hall building matches the system as described in the provided as-built structural drawings and details. The following photographs include representative City Hall structural system and components:

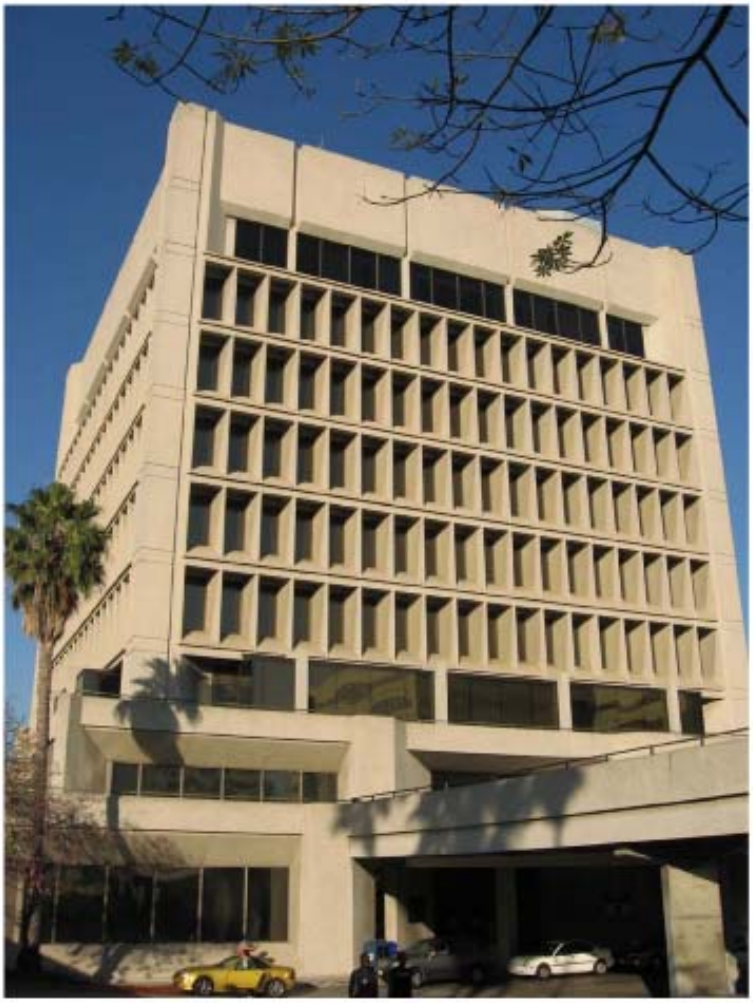

Figure 5.1 City Hall Building, One Manchester Boulevard

Figure 5.2 Edge of Tower at the Parking Level

Figure 5.3 Girders supporting Shear Wall Above

Figure 5.4 Girders supporting Shear Wall Above

Figure 5.5 Girders supporting Shear Wall Above

6.0 DESCRIPTION OF THE CITY HALL BUILDING

The City Hall Building is a 9-Story reinforced concrete building with a penthouse and one subterranean parking level. Partial level is used for emergency operation room and is not located below the tower.

The gravity load supporting system is composed of reinforced concrete slabs, columns and foundation. The lateral force resisting system is composed of 6 reinforced concrete moment frames in each direction of the building, reinforced concrete shear walls between the first and the third levels and reinforced concrete diaphragms. Not all the shear walls reaching the foundation. One shear wall is supported by a footing. Two shear walls are supported by transfer girders at the first level. One shear wall is supported by a column and a basement wall. Figures 6.1 and 6.2 show the building elevation and the typical floor plan, respectively.

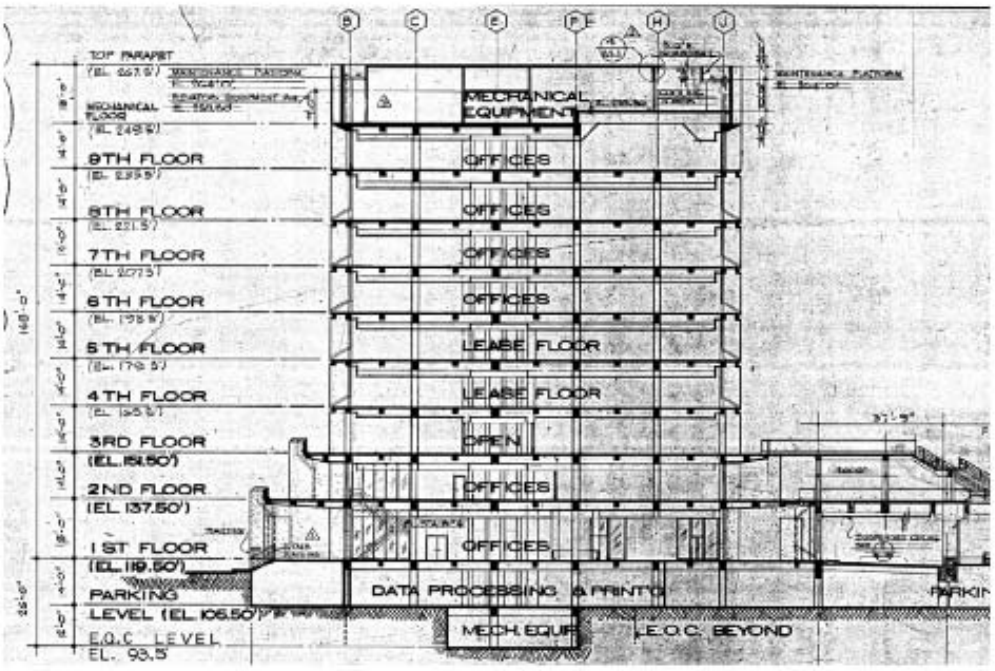

Figure 6.1 Building Elevation

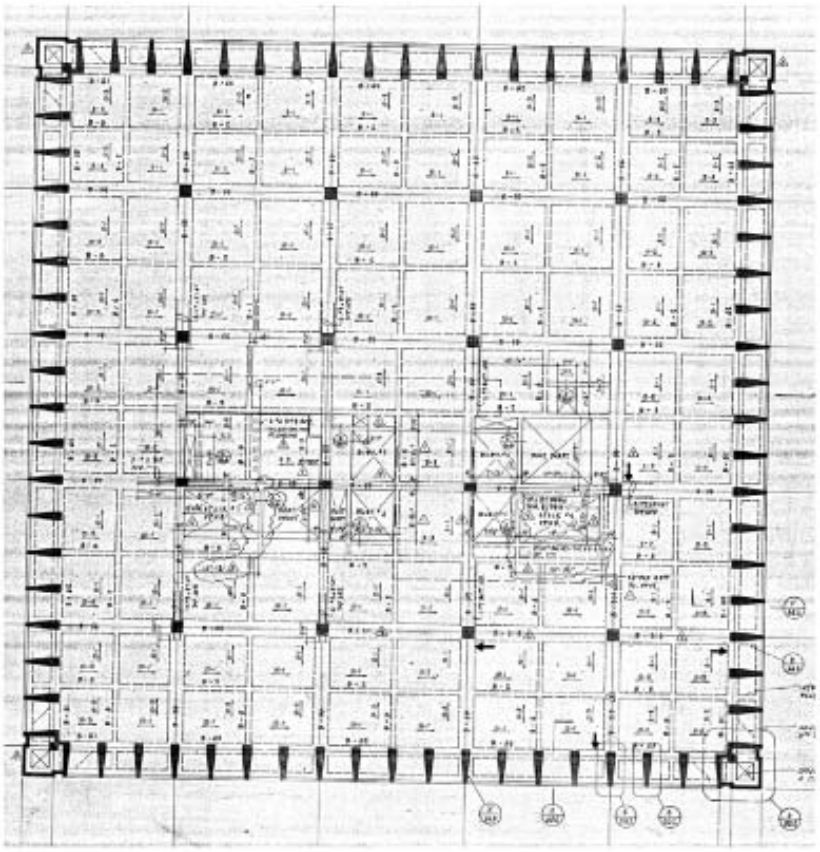

Figure 6.2 4th Thru 8th Floor Plan

7.0 EVALUATION PROCESS

The City Hall Building was modeled using the computer program ETABS. Three dimensional elastic dynamic analysis was conducted. The assumptions that were considered in the model followed Chapters 3 and 6 of the FEMA 356 Document.

7.1 PERFORMANCE OBJECTIVE

The Life Safety Building Performance Level (3-C) as presented in Section 1.5.3.3 was elected as the performance objective for the seismic evaluation. Buildings meeting this level may experience extensive damage to structural and nonstructural components, but some margin against either partial or total structural collapse remains.

Repairs may be required before reoccupancy of the building occurs, and repair may be deemed economically impractical. The risk to life safety in buildings meeting this target Building Performance Level is low. This target Building Performance Level entails somewhat more damage than anticipated for new buildings that have been properly designed and constructed for seismic resistance when subjected to their design earthquakes. Many building owners will desire to meet this target Building Performance Level for severe ground shaking.

7.2 ANALYSIS PROCEDURE

The Linear Dynamic Procedure (LDP) was adopted according to Section 3.2.1. The mathematical modeling requirements provided in Section 3.2.2 was used.

7.2.1 MODELING ASSUMPTIONS

Rigid diaphragms have been used in each floor. ETABS determines the center of mass and center of rigidity of for each floor and determines the torsion moments. The stiffness and strength assumptions of Sections 6.3 and 6.4 were considered.

The specified concrete strength and specified steel yield strength were used in the model. Since the component properties characterize building performance properly in the seismic analysis, the starting point for assessing component properties and condition should be retrieval of available construction documents. Review of these documents was performed to identify primary gravity and lateral load-carrying elements, systems, and their critical components and connections, Section 6.3.2.2.

Section 2.2.6.4 requires that to account for uncertainty in the collection of as-built data, a knowledge factor, k, shall be selected from Table 2-1 considering the selected Rehabilitation Objective, analysis procedure, and data collection process. Knowledge factors shall be applied on a component basis as determined by the level of knowledge obtained for individual components during data collection. A level factor of unity was used.

The stiffness of the framing members was used according to the specified material properties. The effective stiffness was considered according to Section 6.4.1.2. The effectiveness ratios listed in Table 6-5 was used. The effectiveness percentage of the flexural rigidity of the frame beams was taken as 50%, while that of the frame columns was taken as 70%. The concrete shear walls effectiveness percentage was considered as 50%. The effective shear rigidity for the frame beams and columns and the shear walls was considered as 40% of the gross shear rigidity.

7.2.2 SEISMIC HAZARD

Seismic hazard due to ground shaking shall be based on the location of the building with respect to earthquake faults, the regional and site-specific geologic characteristics, and a selected Earthquake Hazard Level.

Section 1.6 of the FEMA 356 requires hazards due to earthquake shaking to be defined on either a probabilistic or deterministic basis. Probabilistic hazards are defined in terms of the probability that more severe demands will be experienced (probability of exceedance) in a 50-year period. Two basic Earthquake Hazard Levels: Basic Safety Earthquake 1 (BSE-1) and Basic Safety Earthquake 2 (BSE-2). The BSE-1 is the earthquake that has a 10% probability is occurrence in 50 years while BSE-2 is that which has a 2% probability is occurrence in 50 years. The Basic Safety Objective (BSO) was achieved by the Life Safety Building Performance Level (3-C) for the BSE-1 Earthquake Hazard Level. Section 1.6.1.2 requires that the BSE-1 response acceleration parameters to be taken as two-thirds of the values of the parameters for the BSE-2 earthquake hazard level, determined in accordance with Section 1.6.1.1.

The USGS 2003 NEHRP maps were used to determine the response acceleration parameters. To accurately determine the seismic parameters, the City Hall Building was determined to be at Latitude of 33.96173 and Longitude of -118.35522. The latitude and longitude facilitate the use of electronic maps and resulted in accurate determination of the response spectra parameters. The site class was taken as D according to Section 1.6.1.4.2. The S_s factor was found to be 1.677 while S_1 was found to be 0.637 for The Basic Safety Earthquake 2 (BSE-2). Since the Site Class was considered as D, the F_a and F_v were taken as 1.0 and 1.5. Therefore, SM_s and SM_1 was determined to 1.677 and 0.955, respectively. The Basic Safety Earthquake 1 (BSE-1) parameters, SD_s and SD_1 were developed by multiplying the SM_s and SM_1 By two thirds. The developed Response Spectra is presented in Figure 7.1.

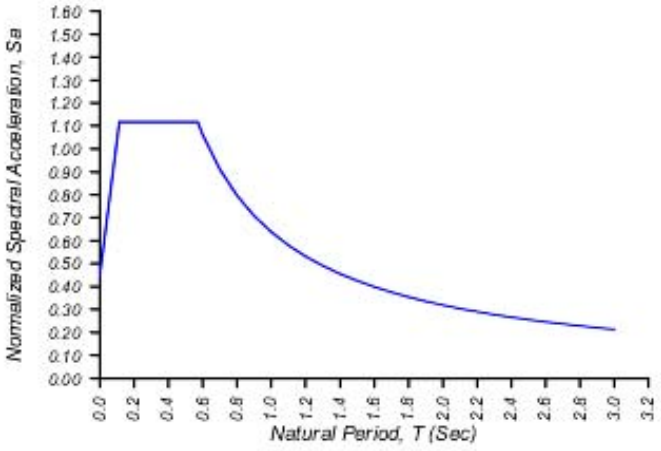

Figure 7.1 Basic Safety Earthquake 1 (BSE-1) Response Spectra

7.2.3 THREE DIMENSIONAL DYNAMIC MODEL

Three dimensional dynamic model was built using the computer program ETABS. The modeling assumptions are listed in Section 7.2.1 of this report. Figures 7.2 and 7.3 present the 3D model. Figure 7.2 shows the model including the diaphragm as a transparent layer, while the diaphragms were set off in Figure 7.3. The analysis was conducted considering the Basic Safety Earthquake 1 (BSE-1) Response Spectra. The results of the analysis include the modal results, the displacements and forces. The forces include the axial forces, bending moments and shear forces on the moment frame beam and column and on the shear walls.

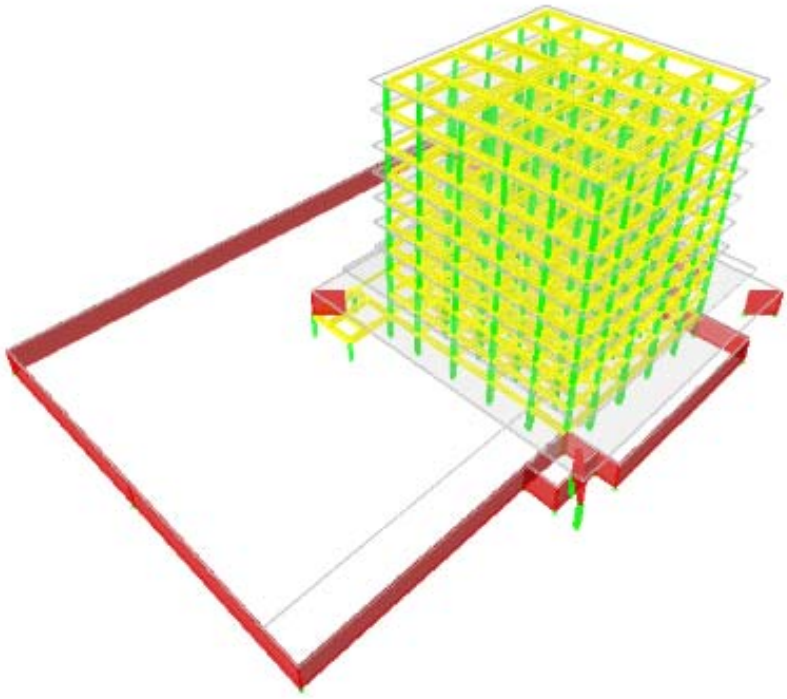

Figure 7.2 Three Dimensional ETABS Model
with Diaphragms

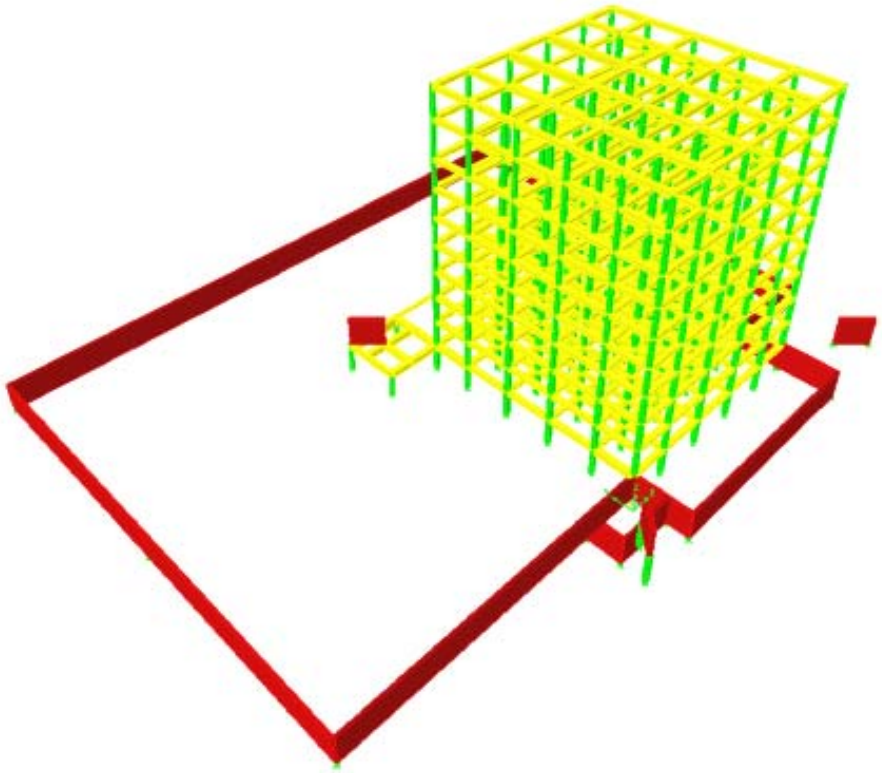

Figure 7.3 Three Dimensional ETABS Model

7.2.4 DYNAMIC ANALYSIS RESULTS

The dynamic analysis was conducted and the results were collected. The modal analysis was performed as a part of the dynamic analysis. The model analysis results are the dynamic characteristics of the building. Twelve modes were considered in the analysis to capture more than 90% of the mass participation ratio. The natural periods for the first three modes were determined to be: 2.85, 2.76 and 2.75. Figures 7.4 to 7.6 show the first three modal shapes.

The frame column on the intersection of Gridlines C and 6 is supported by transfer girder at the 2nd Floor. This is resulted in transferring the seismic forces to the adjacent frames and increasing the moments of these frame columns, Figure 7.7. The shear wall supported by a column below the 1st Floor experiences high uplift force will relatively low gravity load, Figure 7.8.

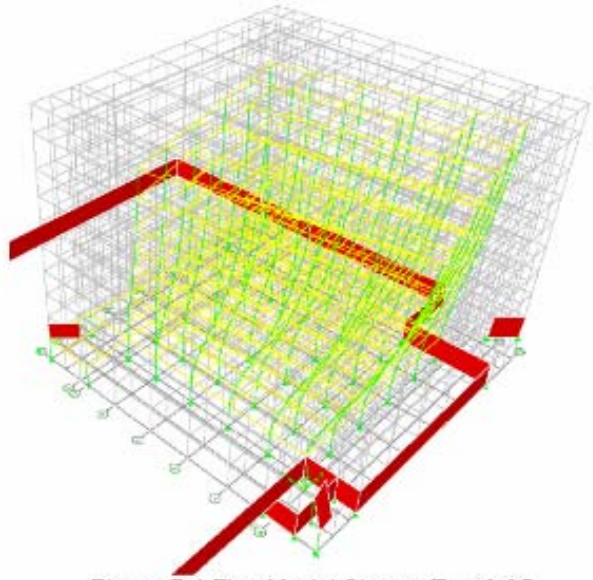

Figure 7.4 First Modal Shape, $T_1 = 2.85$

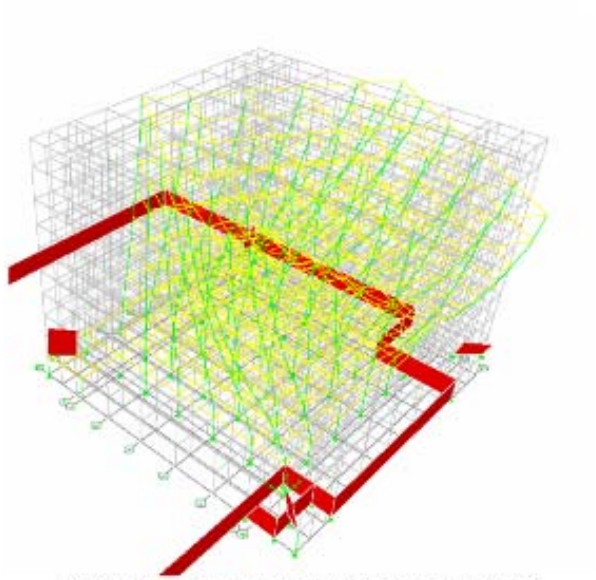

Figure 7.5 Second Modal Shape, $T_2 = 2.76$

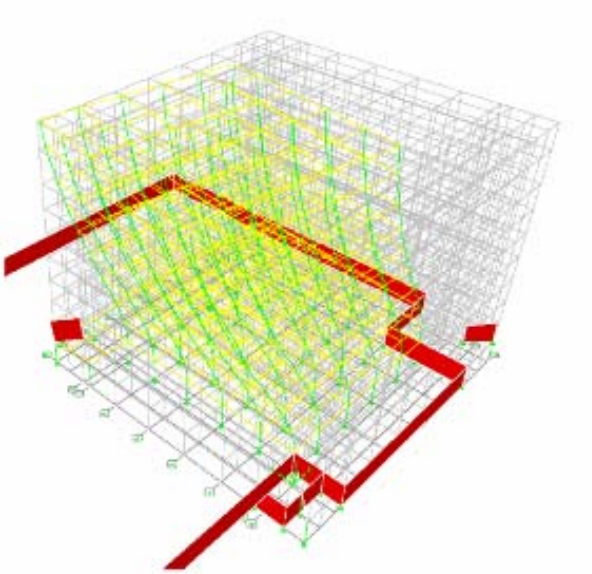

Figure 7.6 Third Modal Shape, $T_3 = 2.75$

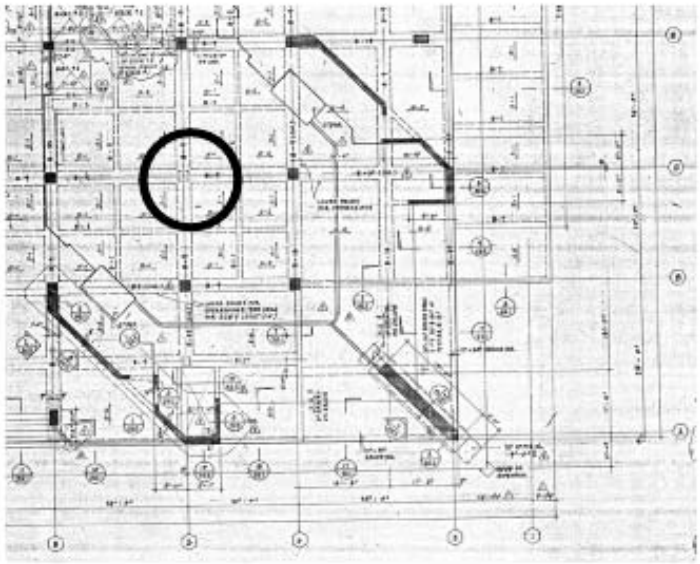

Figure 7.7 Partial Framing Plan

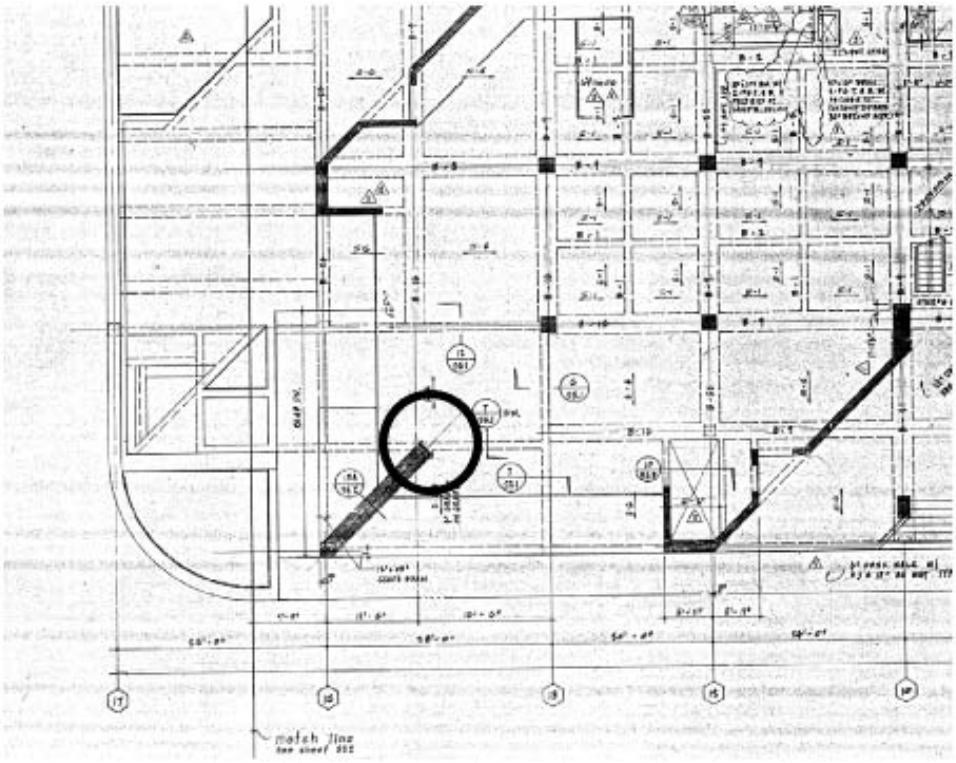

Figure 7.8 Partial Framing Plan

7.2.5 ACCEPTANCE CRITERIA

FEMA 356, Section 2.4.4 requires that each component to be evaluated in accordance with the requirements of Section 3.4. Each component shall be classified as primary or secondary in accordance with Section 2.4.4.2, and each action shall be classified as deformation-controlled (ductile) or force-controlled (nonductile) in accordance with Section 2.4.4.3. Table C2-1 includes deformation-controlled and force-controlled components.

Component strengths, material properties, and component capacities shall be determined in accordance with Sections 2.4.4.4, 2.4.4.5, and 2.4.4.6, respectively. Section 2.4.4.6 requires that detailed criteria for calculation of individual component force and deformation capacities to comply with the requirements of Chapter 6 for reinforced concrete structures.

Since linear dynamic analysis procedure was used, capacities for deformation-controlled actions shall be defined as the product of m-factors and expected strengths, Q_{CE}. Capacities for force-controlled actions shall be defined as lower-bound strengths, Q_{CL}, as summarized in Table 2-3. Section 3.4.2.2 includes the acceptance criteria for linear procedures for both deformation-controlled and for-controlled actions. The following two criteria are used for deformation-controlled and for-controlled actions, respectively:

$$mkQ_{CE} \geq Q_{UD} \qquad kQ_{CL} \geq Q_{UF}$$

Table 6-11 and 6-12 of FEMA 356 include the m-factor values for both frame beams and columns, respectively. Multiple frame beams and columns and shear walls and diaphragms were evaluated using the adopted acceptance criteria.

8.0 EVALUATION CONCLUSIONS

After conducting the dynamic analysis and performing the evaluation adopting the acceptance criteria referenced in Section 7.2.5 of this report. The following are the evaluation conclusions:

8.1 Frame Beams:

The frame beams meet the acceptance criteria for the Life Safety Performance Objectives.

8.2 Frame Columns:

Most of the frame columns satisfy the acceptance criteria. The frame columns above the 2nd Floor, adjacent to the column at Gridlines C & 6 that is supported by transfer girders; will hinge earlier and experience high inelastic strains. These columns need to be retrofitted.

The column supporting a shear wall below the 1st Floor, Figure 7.8; experiences high uplift axial forces. A retrofit is needed for this column.

8.3 Shear Walls:

The shear walls satisfy the acceptance criteria.

8.4 Diaphragms:

The diaphragms have enough strength to meet the acceptance criteria.

8.5 Foundation:

The foundation satisfies the acceptance criteria.

9.0 RETROFIT RECOMMENDATIONS

The following retrofit recommendations are based on the seismic evaluation adopting the Life Safety Building Performance Level (3-C) as set forth by FEMA 356 document:

- A number of nearly six frame columns above the 2nd Floor may be retrofitted by providing confinement at the potential plastic hinge zones which are the top and bottom 4 feet of the columns. The confinement can be achieved by fiber wrapping.

- The column supporting a shear wall below the 1st Floor needs to be retrofitted by providing ties between the girders at the 1st Floor and to the foundation. These ties will need to be anchored to the girders, column and the footing. The column will need to be encased by concrete. Dowels will be drilled and epoxied.

We appreciate being given the opportunity to conduct the seismic evaluation for the City Hall Building. Also, we hope that this report satisfies the intent of the seismic evaluation you have requested.

Please do not hesitate to call should you have any questions.

Very truly yours,

Nagi Abo-Shadi

Nagi Abo-Shadi, PhD, SE
Principal

10.0 REFERENCES

2001 California Building Code, California Code of Regulations, Title 24, Part 2, Volume 2, ICBO, California, 2002.

2003 NEHRP Seismic Maps, USGS, U.S. Geological Survey, 2003

As-built Structural Drawings, Johnson & Nielsen Associates Consulting Structural Engineers, Los Angeles, California, January 1971.

FEMA 356 Document, "Prestandard and Commentary for the Seismic Rehabilitation of Buildings", Federal Emergency Management Agency, Washington, D.C., November 2000.

Appendix E-2: Inglewood City Service Center Seismic Evaluation

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2750 S. Harbor BLVD, Suite K, Santa Ana, CA 92704
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www.structuralec.com

December 28, 2007 (Draft)

Mr. Glen W. C. Kau, PE
Public Works Director
Public Works Department, City of Inglewood
One Manchester Boulevard
Inglewood, California 90312

Regarding: City Service Center Seismic Evaluation, City of Inglewood, California

Dear Mr. Kau:

As indicated in the Scope of Work of the Request for Proposal by the Public Works Department, City of Inglewood, dated June 25, 2007, we are submitting our seismic evaluation report.

1.0 GENERAL BACKGROUND

The Public Works Department at the City of Inglewood requested seismic evaluation of the City Service Center Building located at 222 West Beach Avenue, Inglewood, California 90302. The intent of the seismic evaluation as described by the Public Works Department is to ensure that the performance level of the building shall meet the provisions to safeguard against major structural failure or loss of life and determine the need for seismic retrofit of the structural members of the lateral force resisting system of the building if required according to the 2001 California Building Code and the FEMA Requirements. The Department eliminated evaluation of the non-structural element out of the scope of work as the focus at this point is on the building structural system.

The Life Safety Performance Level according to the FEMA documents constitutes buildings to experience extensive damage to structural and nonstructural components. Also, repairs may be required before re-occupancy of the building occurs, and repair may be deemed economically impractical. The risk to life safety in buildings meeting this target Building Performance Level is low

2.0 SCOPE OF WORK

The scope of work includes the seismic evaluation of the City Service Center Building located at 222 West Beach Avenue, Inglewood, California 90302. The seismic evaluation includes the following:

- Study the as-built structural drawings prepared by Kahn Kappe Lotery Architects Planners, Santa Monica, CA, dated September 1970.

- Provide site visits to confirm that the structural system of the City Service Center Building matches that as described in the as-built structural drawings and details.

- Conduct three-dimensional elastic dynamic analysis of the lateral force resisting system of the City Service Center Building according the adopted code and evaluation criteria.

- Evaluate the structural members of the lateral force resisting system according to the evaluation criteria requirements considering the Life-Safety performance level as requested the Public Works Department.

- Develop an evaluation report that includes the following:

    - Seismic evaluation narrative describing the evaluation process and basis.

    - Description of the structural system based on the as-built drawings and the structural observation resulted from the site visits.

    - Evaluation process including modeling assumption, seismic hazard, three dimensional dynamic model and analysis description and results of the seismic evaluation of the structural members.

    - Evaluation of the lateral force resisting system based on the results of the analysis and the acceptance criteria.

    - Identify structural members that may need seismic retrofit, if any, and provide recommendations for seismic retrofit.

3.0 DOCUMENTS REVIEWED

We have reviewed to the extent necessary to develop our professional opinions the following documents related to the seismic evaluation of the City Service Center Building. These documents included the as-built structural drawings prepared by Kahn Kappe Lotery Architects Planners, September 1970. The precast shop drawings, details and calculations were not found. Also, the building original calculations for the foundation and the lateral system were not found. This is expected for a building designed to comply with the requirements of the 1967 Edition of the Uniform Building Code. The original Geotechnical Report is not available. However the foundation information was provided in the as-built drawings.

4.0 ADOPTED CODE AND ACCEPTANCE CRITERIA

The governing building code is the 2001 California Building Code. Chapter 16, Division VI-R, "Earthquake Evaluation and Design for Retrofit of Existing State-Owned Buildings". Method B of Division VI-R was selected for the evaluation.

The requirements set forth by The ASCE/SEI 31-03 Criteria, American Society of Civil Engineers, "Seismic Evaluation of Existing Building" were adopted. The Life Safety performance level as requested by the Department was employed as the seismic performance criteria for the evaluation study.

The ASCE/SEI 31-03 document is an advanced document of the FEMA 310 "Handbook for the Seismic Evaluation of Buildings-A Prestandard". ASCE 31-03 is intended to replace FEMA 310. All aspects of building performance are considered and defined in terms of structural, nonstructural and foundation/geologic hazard issues. This standard was written to: reflect advancements in technology; incorporate the experience of design professionals; incorporate lessons learned during recent earthquakes; be compatible with FEMA 356, Prestandard and Commentary for the Seismic Rehabilitation of Buildings (FEMA, 2000c); be suitable for adoption in building codes and contracts; be nationally applicable and provide evaluation techniques.

5.0 SITE VISITS

Two site visits were conducted to confirm that the structural system of the City Service Center Building matches the system as described in the provided as-built structural drawings and details. The following photographs include representative structural system and components:

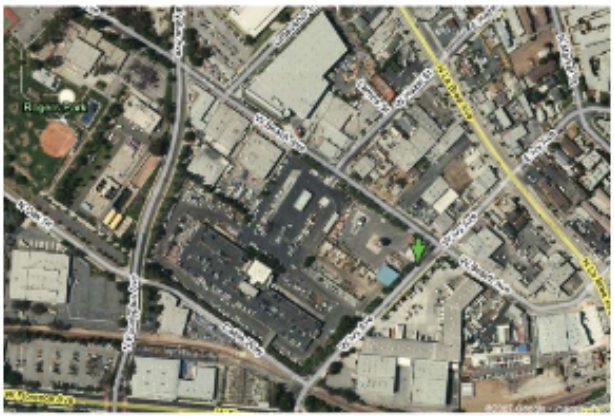


Figure 5.1 Aerial Picture of the City Service Center Building

Figure 5.2 City Service Center Building, 222 West Beach Avenue, Inglewood, California 90302

Figure 5.3 East Stair Case

Figure 5.4 Parking Level Bridge

Figure 5.5 Bridge Connection to the Building

Figure 5.6 Typical Wall to Plank Connection

Figure 5.7 Moisture Effect on a Shear Wall

Figure 5.8 Moisture Effect on a Shear Wall

Figure 5.9 Seismic Joint between Gridlines 16 and 17

Figure 5.10 Moisture Effect on a Cantilever

Figure 5.11 Cantilever Cracks at Gridline 16

Figure 5.12 Mezzanine Slab between Gridlines 7 & 8 and Gridlines E & F

Figure 5.2 includes a picture of Phase I of the building that is called as the Employee Building. A stair case at the east side of the building, connecting to the parking level above is shown is Figure 5.3. The bridge connecting Cable Way to the parking level at the roof of the building is presented in Figures 5.4 and 5.5. The bridge construction is similar to the building construction.

Figure 5.6 shows a typical connection of a concrete brick wall to precast planks. A sample of the moisture effect on the shear walls is presented in Figures 5.7 and 5.8.

The seismic joint between Gridlines 16 and 17 is shown in Figure 5.9. The moisture leak at the seismic joint and at the columns supporting the 2 cantilevers is obvious. The two cantilevers have deflected and cracks are visible. See Figures 5.10 and 5.11.

A mezzanine level between Gridlines 7 & 8 and Gridlines E & F were found not to be documented in the as-built drawings (Figure 5.12). It was observed that no lateral resisting system is provided to brace it laterally. The precast columns are designed only to support the gravity loads. The as-built drawings do not include lateral forces to the precaster to consider in the design of the columns.

6.0 DESCRIPTION OF THE CITY SERVICE CENTER BUILDING

The City Service Center Building is composed of three separate buildings. Phase I consists of 3 stories and is used as the Employee Building. Phase II is composed of 3 sections with seismic gaps between them. The central building is connected to Phase I Building.

The gravity load supporting system is composed of precsat reinforced concrete planks, beams, columns and foundation. The lateral force resisting system is composed of reinforced brick masonry walls. A few reinforced concrete walls are also utilized as part of the lateral force resisting system. Reinforced concrete topping slabs over the precast planks are utilized as structural diaphragms.

The building diaphragm is composed of 2½ inch average thickness concrete topping slabs with welded wire mesh. The minimum thickness for the concrete toping to be used in similar construction is 3½ inches with an average of 4 inches. The concrete topping were found to be cracked and deteriorated by the effect of moisture.

Brick masonry walls of nominal strength f'_m = 1600 psi and lightly reinforced with one layer of #5 rebars spaced horizontally at 48 inches and vertically at 32 inches. Reinforced concrete walls are 8 inches thick with one layer of #3 spaced at 11 inches in both directions. Reinforcing ratios are below the minimum required by current design codes. East section of the building has significant torsion irregularity due to the unbalance in wall layout. This layout was found to have detrimental effect on the shear wall and diaphragm forces. Pile foundations horizontal reinforcing is composed of #3 ties spaced at 24 inches throughout the entire height of the pile.

7.0 EVALUATION PROCESS

The City Service Center Building was modeled using Finite Element Analysis computer software. Three-dimensional elastic dynamic analysis was conducted. The assumptions considered in the modeling process followed Chapter 4 of the ASCE/SEI 31-03 Document. Analysis forces obtained from the three-dimensional analytical model constitutes the force *demands* on structural members whereas the strength of these members constitute the *capacity*. A Demand-to-Capacity ratio (DCR) is established for each member. The DCR is an indicator of the level of ductility demand on each member. The demand-to-capacity ratios were determined for the wall shear force, wall bending moments as well as the diaphragm shear and flexural forces. The demand-to-capacity ratios were evaluated using the acceptance criteria as depicted in Table 4-6 of the ASCE/SEI 31-03. Performance of a specific member is deemed acceptable if the ductility demand on that member (DCR) is less than the ductility capacity (also known as m-factors) as prescribed in Table 4-6. Otherwise, performance of that member is considered not acceptable and hence, a retrofit is necessary.

7.1 PERFORMANCE OBJECTIVE

The Life Safety Building Performance Level (LS) as presented in Sections 1.3 and 2.4 was elected as the performance objective for the seismic evaluation. Buildings meeting this level may experience extensive damage to structural and nonstructural components, but some margin against either partial or total structural collapse remains. Injuries may occur, however, the risk of life threatening injury as a result of structural damage is expected to be low.

Repairs may be required before reoccupancy of the building occurs, and repair may be deemed economically impractical. The risk to life safety in buildings meeting this target Building Performance Level is low. This target Building Performance Level entails somewhat more damage than anticipated for new buildings that have been properly designed and constructed for seismic resistance when subjected to their design earthquakes. Some building owners may desire to meet this target Building Performance Level for more severe ground shaking than the design earthquake.

7.2 ANALYSIS PROCEDURE

The Linear Dynamic Procedure (LDP) was adopted according to Section 4.2.2.2. The mathematical modeling requirements provided in Section 4.2.3 were used.

7.2.1 MODELING ASSUMPTIONS

Rigid diaphragms have been used in each floor. The computer software determines the center of mass and center of rigidity of for each floor and determines the torsion moments. No specific stiffness characteristics of cracked concrete or masonry shear walls are recommended by ASCE/SE31-03. Hence, stiffness of these structural elements was established based on the recommendations of the ACI-318 code and FEMA 356 document. Based on these recommendations, the effective stiffness of both masonry and concrete walls were considered to be 35% of the stiffness of the uncracked walls.

The specified concrete strength and specified steel yield strength were used in the model. Since the component properties characterize building performance properly in the seismic analysis, the starting point for assessing component properties and condition should be retrieval of available construction documents. Review of these documents was performed to identify primary gravity and lateral load-carrying elements, systems, and their critical components and connections.

7.2.2 SEISMIC HAZARD

Seismic hazard due to ground shaking shall be based on the location of the building with respect to earthquake faults, the regional and site-specific geologic characteristics, and a selected Earthquake Hazard Level.

Section 3.5.2.3.1 of the ASCE/SE31-03 requires hazards due to earthquake shaking to be defined on a probabilistic basis. Probabilistic hazards are defined in terms of the probability that more severe demands will be experienced (probability of exceedance) in a 50-year period. This section requires that structures be evaluated to withstand the design earthquake. The design earthquake is defined as the earthquake that has a 10% probability of exceedance in 50 years (or a return period of 475 years). Two approaches are allowed by ASCE/SE31-03 to determine this level of hazard:

- The use of two thirds of the mapped spectral accelerations (short period, S_s , and one-second period spectral accelerations, S_1) associated with ground motions with a 2% probability of exceedance in 50 years (Also known as the maximum considered earthquake, MCE, with a return period of 2500 years)

- The use the 10% in 50 years mapped spectral accelerations.

The first approach is more commonly used by prominent building codes (such as 2000 and later versions of the IBC).

In accordance with the 2002 ASCE 7 Standard, the USGS 2005 edition maps were used to determine the response acceleration parameters. To accurately determine the seismic parameters, the City Service Center Building was determined to be at Latitude of 33.96667 and Longitude of -118.3583. The latitude and longitude facilitate the use of electronic maps and resulted in accurate determination of the response spectra parameters. The site class was taken as D according to Section 3.5.2.3.1. The S_s factor was found to be 1.700 while S_1 was found to be 0.637 for The Maximum Considered Earthquake (MCE). The Site Coefficients F_a and F_v were determined using Tables 3-5 and 3-6 respectively. F_a and F_v were found to be 1.0 and 1.5 respectively. Therefore, S_{Ms} and S_{M1} were equal to 1.700 and 0.956, respectively. The Design Earthquake parameters, S_{Ds} and S_{D1} were developed by multiplying the SM_s and SM_1 By two thirds. The developed Response Spectra is presented in Figure 7.1.

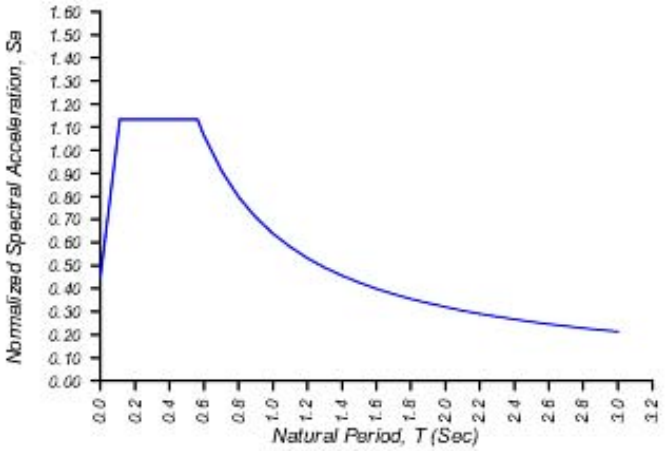


Figure 7.1 Design Response Spectra

7.2.3 THREE-DIMENSIONAL DYNAMIC MODEL

Three-dimensional dynamic model was built using a Finite Element program. The modeling assumptions are listed in Section 7.2.1 of this report. Figures 7.2, 7.3 and 7.4 present the 3D model of the East Building, Middle Building and the West Building, respectively. The diaphragms were set off to show the shear walls in the buildings.

The dynamic (spectral) analysis was conducted considering the Design Response Spectra. The results of the analysis include the modal results, the displacements and forces. The forces include the axial forces, bending moments and shear forces on the shear walls.

7.2.4 DYNAMIC ANALYSIS RESULTS

The dynamic analysis was conducted and the results were collected. The modal analysis was performed as a part of the dynamic analysis. The model analysis results are the dynamic characteristics of the building. Forty modes were considered in the analysis to capture more than 90% of the mass participation ratio. The natural periods for the first mode for each building are presented in this report. The values for the natural periods were found to be 0.29 sec, 0.21 sec and 0.24 sec for the East Building, Middle Building and West Building, respectively. Figures 7.5 to 7.7 show the first modal shape for each building.

The shear stress and bending moment on the shear walls was calculated for the spectral forces. Also, the diaphragm forces were calculated for the evaluation. The demand-to-capacity ratios were determined for the wall shear stresses, wall bending

moments and the diaphragm forces. The demand is at the spectral level as constituted by the ASCE/SEI 31-03. The demand-to-capacity ratios were evaluated using the acceptance criteria adopted for the seismic evaluation.

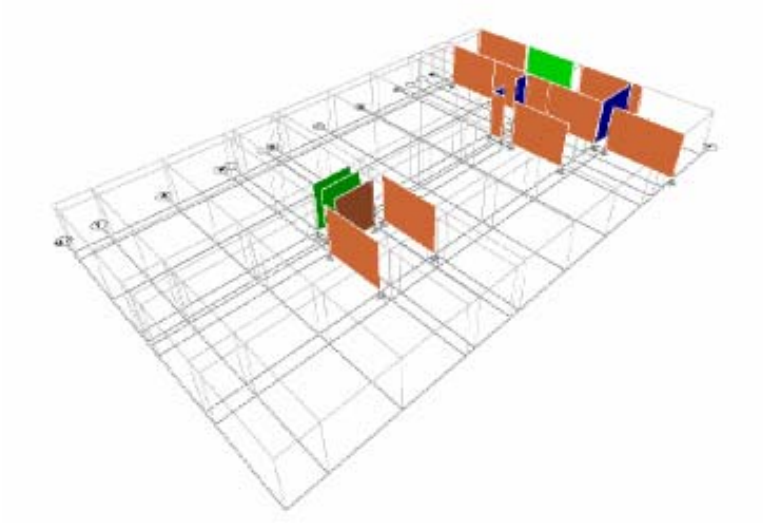


Figure 7.2 East Building - 3-Dimensional Model

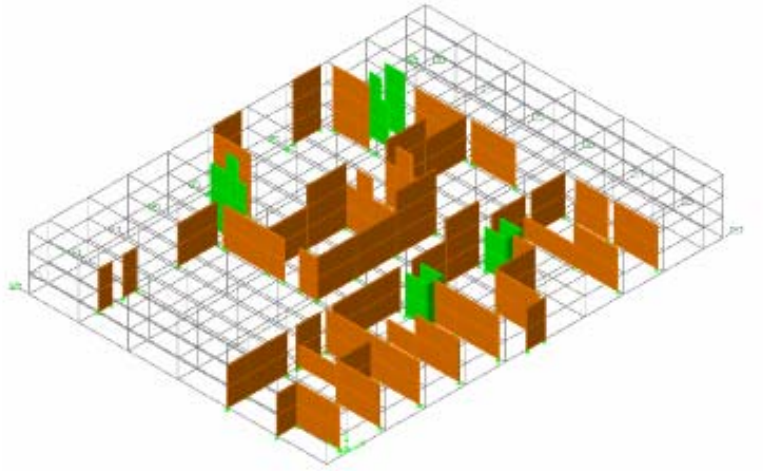


Figure 7.3 Middle Building - 3-Dimensional Model

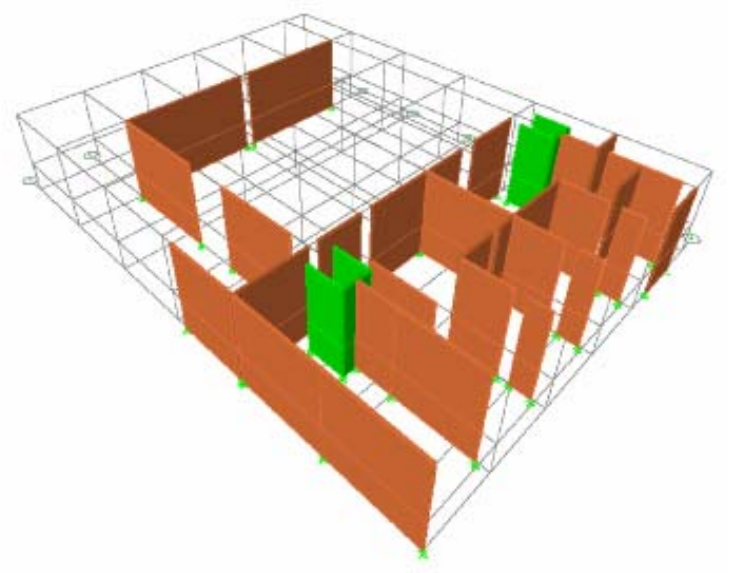


Figure 7.4 West Building - 3-Dimensional Model

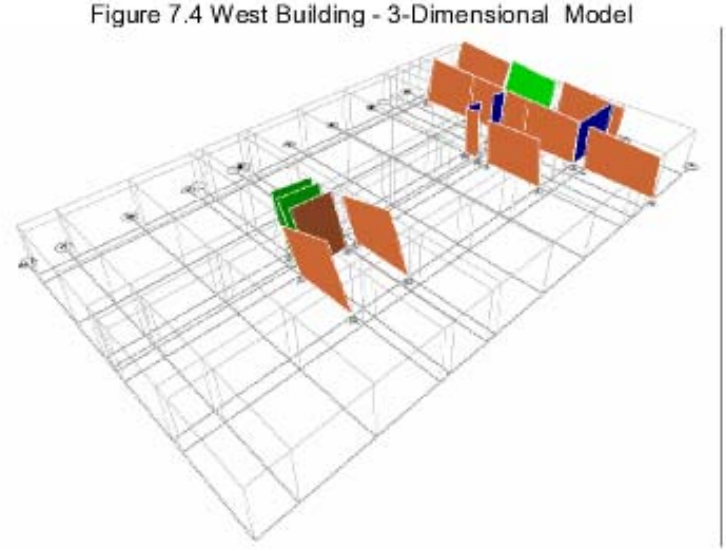


Figure 7.5 East Building - First Modal Shape, T =0.29 second

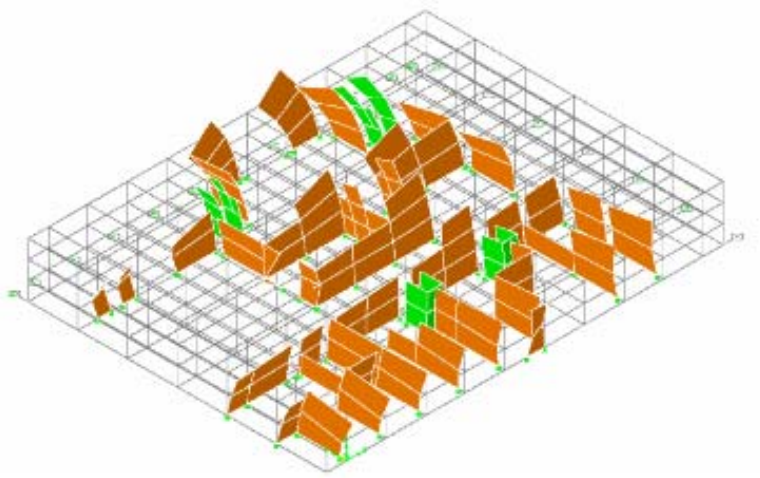


Figure 7.6 Middle Building - First Modal Shape, T =0.21 second

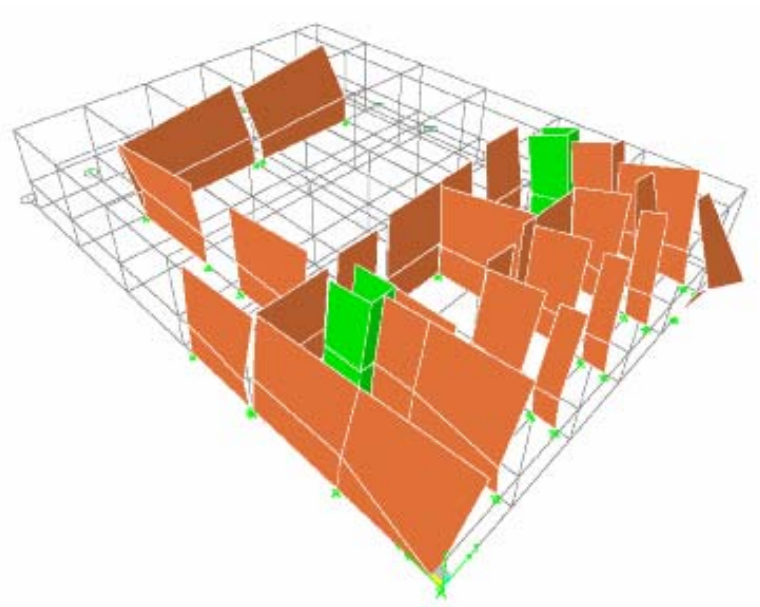


Figure 7.7 West Building - First Modal Shape, T =0.24 second

7.2.5 ACCEPTANCE CRITERIA

The ASCE/SEI 31-03 Criteria, American Society of Civil Engineers, "Seismic Evaluation of Existing Building" were adopted. The Life Safety performance level – as requested by the Department was employed as the seismic performance criteria for the evaluation study. The document requires that each component to be evaluated by comparing the demand at the spectral level to the expected capacity. Each force shall be classified as deformation-controlled (ductile) or force-controlled (non-ductile). Since linear dynamic analysis procedure was used, capacities for deformation-controlled actions shall be defined as the product of m-factors and expected strengths. Tables 4-6 and 4-17, ASCE/SEI 31-03 includes the m-factor values for concrete diaphragms and shear walls.

7.2.6 DISCUSSION

The following discussion is to present the evaluation outcomes:

Building Redundancy:
Section 4.4.2.1.1 indicates that for Tier 1 analysis, the building needs to have at least 2 or more lines of shear walls. This has been justified in this building.

Reinforced Masonry Shear Walls:
Wall Thickness
Section 4.4.2.3.6 requires that the thickness of bearing walls to be at least 1/25 of the unsupported height. In this building, all the walls are non-bearing walls due to the fact that the precast columns support the gravity loads.

Reinforcing Steel
Section 4.4.2.4.2 of the ASCE 31-03 indicates that the total vertical and horizontal reinforcing steel shall be greater than 0.002 for life safety. All the masonry shear walls in this building are lightly reinforced and the volumetric steel ratio is 0.0017.

Shear Stress
Tier 1 requires that the shear stress in the reinforced masonry walls to be less than 70 psi for life safety. The ASCE 31-03 requires that with the analysis presented in Section 4.2 and the "m" factor presented in Table 4-17, the adequacy of the walls shall be checked. Several walls fail to satisfy the acceptance criteria set forward by the ASCE 31-03. Figures 8.1 to 8.3 show the walls that fail in their shear capacity.

Diaphragms:
Building diaphragm is composed of 2½ inch average thickness concrete topping slabs with welded wire mesh. Performance of the diaphragm is evaluated based on the forces depicted in section 4.2.2.2.4. The demand-to-capacity ratio of the

concrete diaphragm shall be compared to the m-factor as in Table 4-6. The checks conducted included:

1. The adequacy of the diaphragm to resist in-plane (horizontal) shear forces
2. The adequacy of the shear transfer mechanism between the shear walls and the diaphragm along their interface
3. The adequacy of the chord members (chord bars) at the perimeter of the diaphragm to resist the in-plane bending actions

Foundation:
The foundation system is composed of piles and pile caps. The typical pile diameter is 24 inches and the typical cap depth is 4'-0". The pile capacity is not shown on the drawings. Also, the soil's report indicated on Sheet S1.1 is not available. Based on the pile size and cap thickness, the foundation system seems to be adequate. However, a confirmation is needed by a Geotechnical reference (original soil's report or more investigation to be performed later).

8.0 EVALUATION CONCLUSIONS

After conducting the dynamic analysis and performing the evaluation adopting the acceptance criteria referenced in Section 7.2.5 of this report, the following evaluation conclusions were found:

8.1 Shear Walls:

The shear walls are poorly distributed in the East Building. Also, all shear walls are lightly reinforced. Section 6.0 includes description of the shear walls. The shear walls that do not meet the acceptance criteria are shown in Figures 8.1 to 8.3.

Wall reinforcing that resist out-of-plane forces on shear walls with height of more than 20 feet is inadequate.

8.2 Diaphragms:

Investigation showed that the shear transfer dowels and the chord rebars are inadequate to resist the seismic forces. Also, the diaphragms have been deteriorated in many locations by the moisture effect.

8.3 Foundation:

The foundation seems satisfies the acceptance criteria provided that a confirmation of the pile capacity will be provided in the original soil's report. Please see the discussion on Section 7.2.6.

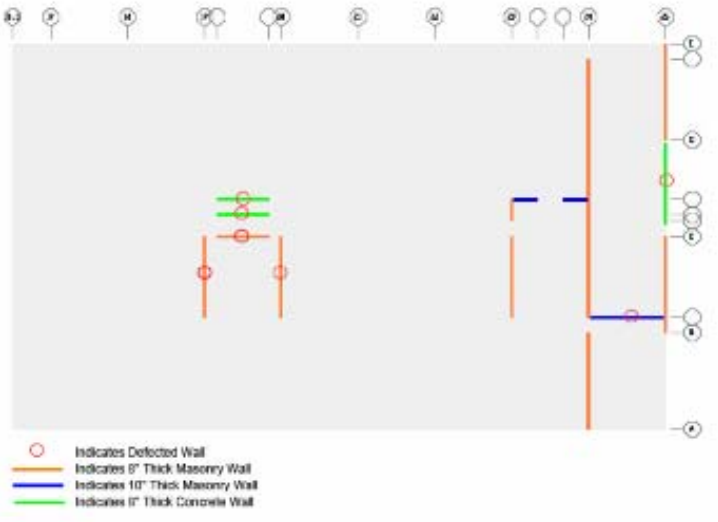


Figure 8.1 East Building - Roof Plan

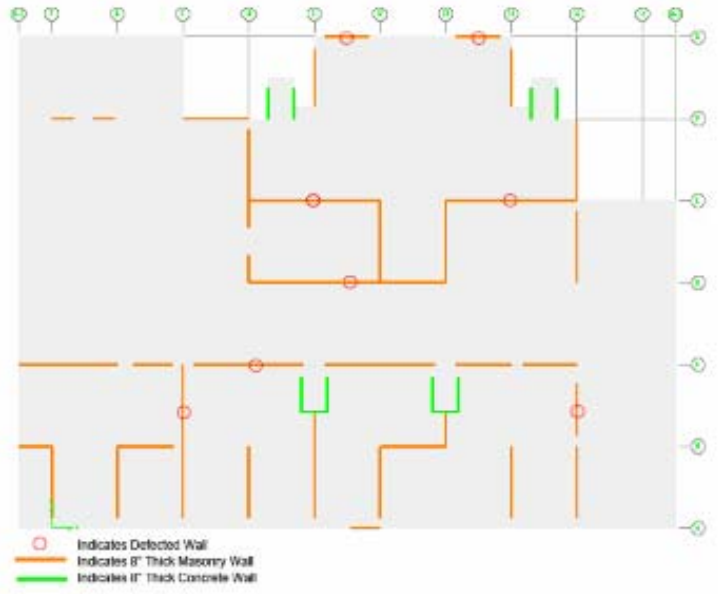


Figure 8.2 Middle Building - Roof Plan

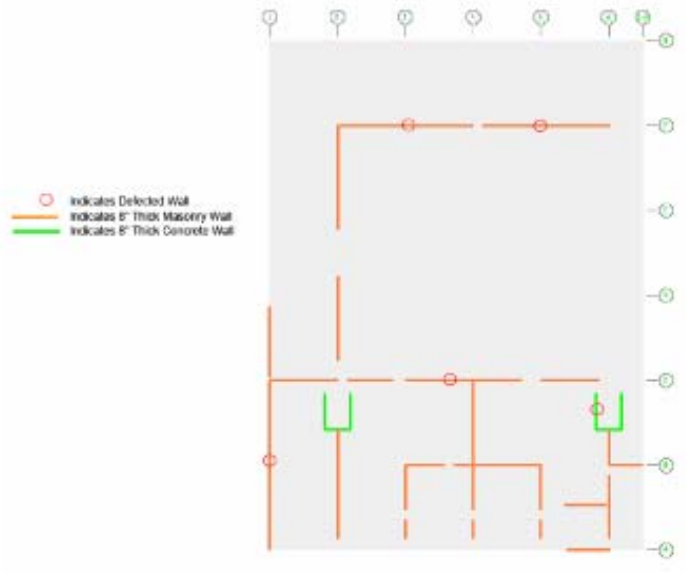


Figure 8.3 West Building - Roof Plan

9.0 RETROFIT RECOMMENDATIONS

The following retrofit recommendations are based on the seismic evaluation adopting the Life Safety Building Performance Level as set forth by ASCE/SEI 31-03 document:

- The shear walls that fail to satisfy the acceptance criteria need to be retrofitted. A common retrofit scheme for walls is obtained by Gunite or Shotcrete technique where a layer of concrete is gunshot to one face of the wall. The thickness of this concrete layer ranges from 8 to 10 inches. Reinforcing of the shotcrete can be one layer of steel bars. It also includes drill and epoxy dowels with 90 degrees standard hooks to ensure the bond between the existing masonry wall and the new concrete layer. The wall boundary element reinforcing (jamb reinforcing) will be added in this layer.

- For walls of a height of 20 feet, and do not need retrofit, steel plates will be needed to reinforce the wall to resist the out-of-plane forces.

- To ensure the connection of the diaphragm to the shear walls, dowels will be needed besides steel angles that will work as drag members.

- Since the concrete topping is deteriorated by the moisture effect, partial replacing of the concrete topping will be needed. The size can be determined after removing the paving topping and confirm the extent of the damage. Moisture proof layer will be needed between the concrete topping and the paving layer. Chord bars are needed at the boundaries of the diaphragms (slabs). This can be provided by attaching steel sections (angles and/or channels) using post installed anchors (drill and epoxy). For those areas that the concrete topping will be replaced, conventional reinforcing bars will be used instead of the rolled steel sections such as angles and channels.

We appreciate being given the opportunity to conduct the seismic evaluation for the City Service Center Building. Also, we hope that this report satisfies the intent of the seismic evaluation you have requested.

Please do not hesitate to call should you have any questions.

Very truly yours,

Nagi Abo-Shadi

Nagi Abo-Shadi, PhD, SE
Principal

10.0 REFERENCES

2001 California Building Code, California Code of Regulations, Title 24, Part 2, Volume 2, ICBO, California, 2002.

ASCE/SEI 31-03 Criteria, American Society of Civil Engineers, "Seismic Evaluation of Existing Building"

2005 NEHRP Seismic Maps, USGS, U.S. Geological Survey, 2005

FEMA 356 Document, "Prestandard and Commentary for the Seismic Rehabilitation of Buildings", Federal Emergency Management Agency, Washington, D.C., November 2000.

As-built Structural Drawings, Kahn Kappe Lotery Architects Planners, Santa Monica, CA, September 1970

Appendix E-3: Inglewood Water Treatment Plant Analysis

4.0 METEOROLOGICAL CHARACTERISTICS OF THE SITE

The South Coast Air Quality Management District, Downtown Los Angeles Air Monitoring Station is identified as the local meteorological station for this site. The meteorological data from this site was reviewed to determine potential wind directions and atmospheric stability classes applicable to the Water Treatment Plant. Tables 1 and 2 provide the percentages of time for various atmospheric conditions in terms of wind direction, wind speed and atmospheric stability classes. Atmospheric stability class indicates level of turbulence in the air. Letter designations between A and F are used for this purpose. Stability Class A represents the most turbulent and Class F the most stable conditions. Light winds, which correlate with stable atmospheres (D-F Stability Classes), are more likely to originate from the west through north. Atmospheric stability classes D to F were recorded 60 % of the time during the monitoring year, calendar year 1981.

Table 1 Frequency of Wind Speed and Wind Direction
(Based on 1981 Data Collected at SCAQMD's Downtown Los Angeles Station)

		Wind Speed (m/s)					
Direction	**All Wind Speeds***	**0-2**	**2-4**	**4-6**	**6-8**	**8-10**	**> 10**
N	8.38	5.13	2.58	0.65	0.02	0	0
NNE	6.87	2.31	3.41	1.15	0	0	0
NE	21.12	2.56	7.98	9.86	0.65	0.07	0
ENE	8.65	4.7	2.8	1.13	0.01	0	0.01
E	2.93	2.4	0.22	0.3	0.02	0	0
ESE	2.18	1.87	0.18	0.1	0.02	0	0
SE	1.43	1.2	0.14	0.08	0.01	0	0
SSE	2.4	2.24	0.11	0.05	0	0	0
S	12.19	8.71	3.37	0.1	0.01	0	0
SSW	12.71	8.72	3.42	0.38	0.18	0	0
SW	5.16	3.54	1.19	0.41	0.01	0.01	0
WSW	3.72	1.84	1.1	0.74	0.02	0.02	0
W	0.71	0.42	0.08	0.21	0	0	0
WNW	0.97	0.72	0.09	0.16	0	0	0
NW	1.13	0.86	0.18	0.09	0	0	0
NNW	9.45	7.77	1.4	0.26	0.01	0	0
All Directions	**100.0**	**54.98**	**28.25**	**15.67**	**0.98**	**0.1**	**0.01**

* All entries are in percentage.

Table 2 Frequency of Atmospheric Stability Classes
(Based on 1981 Data Collected at SCAQMD's Riverside monitoring station)

Stability Class	A	B	C	D	E	F	G
%	1.6	10.56	13.89	31.99	12.28	16.35	13.33

The meteorological conditions used in this study for dispersion modeling (per §2750.2 of CalARP; Reference 2) are summarized below:

Scenario	Stability Class	Wind Speed	% Of Time
Worst Case	F	1.5 m/s	16
Alternative Cases	D	3 m/s	32

Since, as it is discussed below, the dispersion distances provided in the Risk Management Program Guidance for Wastewater Treatment Plants (Reference 4) is used in this study, the ambient temperature and humidity levels recorded at the local meteorological station was not analyzed.

5.0 RELEASE SCENARIOS AND DISPERSION ANALYSIS

The offsite consequence modeling consists of a worst-case scenario and two alternative release scenarios. These scenarios and corresponding dispersion analysis are described below.

5.1 Worst-Case Release Scenario

Release Quantity

In §2750.3 (b) of Reference 2, the quantity to be considered for worst-case release scenario is defined as follows:

> "*. . . . The worst-case release quantity shall be the greater of the following:*
> *(1) For substances in a vessel, the greatest amount held in a single vessel, taking into account administrative controls that limit the maximum quantity; or*
> *(2) For substances in pipes, the greatest amount in a pipe, taking into account administrative controls that limit the maximum quantity.*"

The greatest amount held in a single vessel at this site is one ton (2,000 lb.) of liquid chlorine at ambient temperature, under pressure. The Chlorination System consists of a set of ton-containers connected to the system through a vacuum regulator valve attached to the upper valve (i.e., vapor side) of each container. Given individual self-closing vacuum regulators at each container, there is no single failure event that can lead to more than one container releasing. Therefore, release from only one container is selected for the worst-case analysis. The quantity for worst-case release scenario is taken to be 2,000 lb. (907 kg), the contents of a full ton-container.

Other Factors

According to §2750.3 (h) of Reference 2, the following two additional factors must be taken into consideration in defining the worst-case release scenario:

> *". . . . .the owner or operator shall select as the worst case for flammable regulated substances or the worst case for regulated toxic substances, a scenario based on the following factors if such a scenario would result in a greater distance to an endpoint defined in Section 2750.3 (a) beyond the stationary source boundary than the scenario provided under paragraph (b) of this section:*
>
> *(1) Smaller quantities handled at higher process temperature or pressure; and*
>
> *(2) Proximity to the boundary of the stationary source."*

The above given provisions are not applicable to this site because the chlorination process does not use heat or external pressurization.

Release Rate

In §2750.3 (c) (1) of Reference 2, the release rate to be considered for a toxic gas worst-case release scenario is defined as follows:

> *"For regulated toxic substances that are normally gases at ambient temperature and handled as a gas or as a liquid under pressure, the owner or operator shall assume that the quantity in the vessel or pipe, as determined under paragraph (b) of this section, is released as a gas over 10 minutes. The release rate shall be assumed to be the total quantity divided by 10 unless passive mitigation systems are in place."*

As it was established above, the total quantity to be considered for worst-case release is 2,000 lb. of chlorine. Per the above statement in the regulation the release rate is therefore 2,000lb. / 10 min. = 200 lb. per minute (1.51 kg/s).

Passive Mitigation

The one-ton containers are stored in an enclosed building, and the release rate to the outside air may be considerably less than if it were stored outside. This facility receives one-ton containers of chlorine from a vendor's delivery truck. Chlorine deliveries are performed with the vendor's truck inside the Chlorination Building. Therefore, the Chlorination Building can be considered as a passive mitigation measure. The regulation allows for the incorporation of passive mitigation features in establishing the release rate. Per Reference 2, the release rate may be modified by a factor of 0.55, to allow for this feature. Thus, the release rate considered for dispersion analysis is as follows.

(Release Rate) = 0.55 x (Release Quantity)/10

(Release Rate) = 0.55 x 2,000 lb./10 min. = 110 lb./min.

The release rate for a one-ton container will be 110 pounds per minute.

Topography

The local topography surrounding the facility is classified as urban. An urban classification is assigned, per the definition provided in the regulation (§2750.2 (e) of Reference 2) because, as it is discussed in Section 3.2 above, a significant portion of the immediate area surrounding the facility is occupied by industrial or commercial buildings.

Estimation of the Distance to Toxic Endpoint

For this report, Exhibit 4-4 of Reference 4 is used to identify the distance to the toxic endpoint of 3-ppm (0.0087 mg/L). The downwind distance of the hazard footprint is found to be 0.9 miles (from an interpolation between 110 lb./min and 150 lb./min entries of Exhibit 4-4). It must be noted that the shape of the area downwind affected by chlorine gas resembles a teardrop, the maximum width of which depends on the meteorological conditions. Also, chlorine gas will reach the estimated distance only if the wind direction and wind speed would stay the same for the entire length of time.

Additional Worst Case Release Scenarios

Section 2750.3 of Reference 2 states:

> *"Additional worst-case release scenarios for a hazard class if a worst-case release from another covered process at the stationary source potentially affects public receptors different from those potentially affected by the worst-case release scenario developed under paragraphs . . ."*

As was stated earlier in this section, the chlorination system is the only process at this site that requires the development of a hazard assessment.

5.2 Alternative Release Scenarios

In §2750.4 of Reference 2, the requirements for alternative release scenario analysis is specified as follows:

> *"(a) The number of scenarios. The owner or operator shall identify and analyze at least one alternative release scenario for each regulated toxic substance held in a covered process(es) . . .*
>
> *(b) Scenarios to consider.*
>
> *(1) For each scenario required under section (a), the owner or operator shall select a scenario:*
>
> *(A) That is more likely to occur than the worst-case release scenario under Section 2750.3; and*
>
> *(B) That will reach an endpoint offsite, unless no such scenario exists."*

Scenario Definition

Two scenarios have been considered as alternative release scenarios. Since there were no releases, in the past five years, the selection of alternative scenarios is based on the scenarios suggested in Section 2750.4 (b) (2) of Reference 2 and process hazard analysis (PHA) of this site (Reference 5).

In one scenario (designated as ALT-1) it is postulated that a fusible plug on the low side of a ton-container fails and leads to the release of liquid chlorine into the chlorination room. This scenario can be regarded as corresponding to the following scenario defined in Section 2750.4 (b) (2) (C) of Reference 2:

> *"process vessel or pump releases due to cracks, seal failure, or drain, bleed, or plug failure"*

This scenario is equivalent to a mechanical failure (e.g., from fatigue or manufacturer error) of a fusible plug while. There are three fusible plugs on the end plate of each ton-container. The lowest plug, when the container is full, is always exposed to liquid chlorine. Therefore, to be conservative (i.e., to obtain the largest release quantity), it is postulated that the lowest plug fails and liquid chlorine is released. This scenario is postulated as a liquid release through a 1/4" diameter opening.

The second scenario (designated as ALT-2) is postulated as a valve leak on a ton-container outside the chlorine building. This is equivalent to receiving a ton-container with a defective (leaking) valve. This scenario can be regarded as corresponding to the following scenario defined in Section 2750.4 (b) (2) (C) of Reference 2:

> *"process piping releases from failures of flanges, joints, welds, valves and valve seals, and drains or bleeds"*

There are two valves on a ton-container that are internally piped to the opposite sides of the container (top/bottom). This piping configuration allows, when valves are positioned vertically (i.e., one on top of the other), for one valve to draw from the vapor space of the container (top valve) and the other from the liquid side (bottom valve). For this scenario, to be conservative, it is postulated that the leaking valve draws from the liquid side. This scenario is postulated as a liquid release through a 1/16" diameter opening.

Release Rate

The release rate for the two alternative scenarios are estimated using the information provided in Exhibit 4-12 of Reference 4.

Scenario	Opening	lb./min
ALT-1	1/4"	150
ALT-2	1/16"	10

Since, ALT-1 occurs indoors, the release rate into the open atmosphere, per the methodology established in Reference 4, is 55% of the indoor release rate. Thus, the equivalent release rate for ALT-1 is 82.5 lb./m.

Topography

As discussed for the worst-case scenario, the local topography surrounding Sanford M. Anderson Water Treatment Plant is classified as urban. The same classification applies to the alternative release scenarios.

Estimation of Distance to Toxic Endpoint

From Exhibit 4-11 of Reference 4 and using the release rates of 82.5 lb./m and 10 lb./m for the two scenarios, the following downwind distances of the hazard footprint have been found:

Scenario	mile	km
ALT-1	0.20	0.32
ALT-2	0.10	0.16

As in the worst-case release scenario, the shape of the area downwind affected by chlorine gas resembles a teardrop, the maximum width of which depends on the meteorological conditions.

Active Mitigation Measures

Unlike the worst-case scenario, active mitigation measures can be considered in analyzing the alternate release scenario. For the alternative scenarios, it is conservatively assumed that no active mitigation takes place.

5.3 Summary of Release and Dispersion Analysis

Three release scenarios are postulated. The first scenario is considered as the worst-case and is defined per regulatory requirements as the release of the entire content of the largest vessel (2,000 lb.) in 10 minutes inside the Chlorination Building. Two alternative scenarios have been considered. ALT-1 is a fusible plug failure on the liquid side while the ton-container is located inside the Chlorination Building. Therefore, ALT-1 scenario considers passive mitigation in dispersion calculations. ALT-2 is a valve leak discovered upon delivery of a ton-container (an outdoor release). Table 3 provides a summary of the parameters used in defining the release scenarios, atmospheric and topographic conditions and toxic endpoints. The last row of Table 3 presents the downwind distances associated with the three scenarios.

Table 3 Dispersion Analysis Summary

Parameter	Worst-Case	ALT-1	ALT-2
Material Released	Chlorine	Chlorine	Chlorine
Type of Material (liquid / gas / liquid under pressure / refrigerated liquid)	Liquid under pressure	Liquid under pressure	Liquid under pressure
Release Quantity (lb.)	2,000	2,000	2,000
Type of Release (liquid/gas)	Liquid	Liquid	Liquid
Release Rate to Outside Air (lb./m)	110	82.5	10
Release Time	10 minutes	Until empty	Until empty
Release Direction	Vertical	Vertical	Horizontal
Release Temperature (°F)	77	77	77
Release Pressure (atm)	1	1	1
Height of release (ft) / (m)	0 / 0	8 / 2.4	0 / 0
Ambient Temperature (°F)	77	77	77
Ambient Pressure (atm)	1	1	1
Relative Humidity	50%	50%	50%
Stability Class	F	D	D
Wind Speed (m/s)	1.5	3.0	3.0
Surface Roughness	Urban	Urban	Urban
Averaging Time (minute)	N. A.	N. A.	N. A.
Type of gas (dense/neutrally buoyant)	Dense	Dense	Dense
Toxic Endpoint Concent. (ppm) / (mg/l)	3 / 0.0087	3 / 0.0087	3 / 0.0087
Distance to Toxic Endpoint (mile) / (km)	0.9 / 1.4	0.2 / 0.3	0.1 / 0.2

6.0 OFFSITE IMPACTS

6.1 Affected Population

The population around the facility that may potentially be affected by chlorine gas at a concentration exceeding the toxic endpoint is identified. In §2750.5 of Reference 2 it is specified that:

> "*(a) The owner or operator shall estimate in the RMP the population within a circle with its center at the point of the release and a radius determined by the distance to the endpoint defined in Section 2750.2(a).*

(b) *Population to be defined. Population shall include residential population. The presence of institutions (schools, hospitals, prisons), parks and recreational areas, and major commercial, office, and industrial buildings shall be noted in the RMP."*

Landview V Environmental Mapping Software (Reference 6) was used for this purpose, which is based on U.S. 2000 Census data. When calculating population densities for large areas, which encompass many tracts, Landview provides the results within a good level of accuracy. However, for small areas that encompass only two or three partial tracts, the population data may be skewed due to the unequal distribution within the tract.

Table 4 displays the estimated populations that are within the circle centered at the release point, with the radius defined by the downwind distances of the three scenarios. This representation of the population covers all wind directions. As it is mentioned in the preceding section, in the unlikely event of a release, the plume of chlorine gas will only cover a teardrop shaped surface extending downwind. Therefore, only a small fraction of the populations mentioned in Table 4 will be affected in case of an actual release.

Table 4 Estimated Population Data

Scenario	Distance to Toxic Endpoint	Residential Population within the Circle
Worst Case Release	0.9 miles	37,940
ALT-1: Fuse plug leak inside the building	0.2 miles	583
ALT-2: Valve leak outside the building	0.1 mile	1

6.2 Offsite Receptors

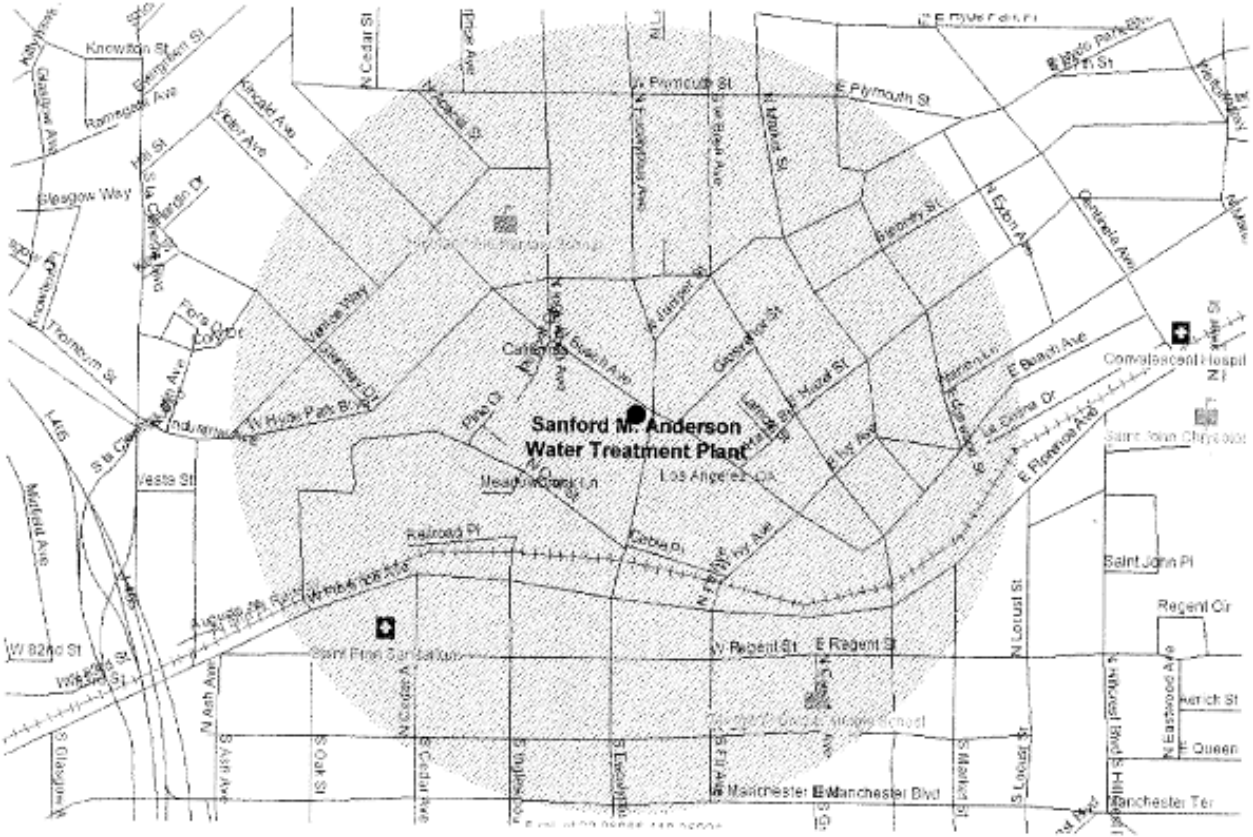
Population - RMP requirements state that sensitive populations such as schools, hospitals, day care centers, long term health care facilities, prisons, residential areas, public use parks/recreational areas, and major commercial facilities, located within the circles defined by the downwind distances must be identified. The sensitive population receptors were found using Landview® V Environmental Mapping Software (Reference 6), Yahoo Maps (Reference 7), Thomas Guide (Reference 8) and a drive through of the neighborhood. The sensitive population receptors within a 0.5-mile radius are shown in Table 5.

Figure 2 shows a map of the sensitive population receptors within a 0.5-miles radius, since the larger of the two alternative release scenarios distance to the toxic endpoint is only 0.2 miles.

Table 5 Sensitive Population Receptors within 0.5-Mile Radius

Population Receptor	Telephone Number	Address	Type	Distance to Release Point
Hudnall Elementary School	(310) 680-5420	331 W Olive St	School	0.4
Highland Elementary School	(310) 680-5460	430 Venice Way	School	0.4
La Tijera Elementary School	(310) 680-5260	1415 N La Tijera Blvd	School	0.5
Inglewood High School	(310) 680-5200	231 S Grevillea Ave	School	0.4
George W. Crozier Middle School	(310) 680-5280	151 N Grevillea Ave	School	0.3
Training Research Foundation	(310) 677-4711	323 S Eucalyptus Ave	Preschool	0.4
First Lutheran Pre-School	(310) 674-0310	600 W Queen St	Preschool	0.4
Village Preschool	(310) 680-9922	434 S Grevillea Ave	Preschool	0.5
Training Research Foundation	(310) 677-6018	400 W Beach Ave	Daycare	0.2
Jordan Day Care	(310) 412-2060	200 W Queen St	Daycare	0.2
Inglewood Avenue Preschool	(310) 674-5011	215 S Inglewood Ave	Daycare	0.3
Kid's Castle Child Care Center	(310) 677-2997	745 N La Brea Ave	Daycare	0.4
Sunshine Day Care Center	(310) 680-9717	504 Edgewood St	Daycare	0.5
Youth & Family Center Infant	(310) 671-6719	401 S Inglewood Ave	Daycare	0.5
Village Preschool	(310) 680-9922	434 S Grevillea Ave	Daycare	0.5
Westchester Villa Retirement	(310) 673-1093	220 W Manchester Blvd	Long Term Health	0.3
Eucalyptus Park Apartments	(310) 677-7482	811 N Eucalyptus Ave	Long Term Health	0.4
Wells Guest Home	(310) 412-1886	111 S Oak St	Long Term Health	0.4
Regency Towers	(310) 677-5400	151 N Locust St	Long Term Health	0.5
Inglewood Meadows	(310) 672-3988	1 S Locust St	Long Term Health	0.5
Rogers Park	(310) 412-5504	400 W Beach Ave	Park	0.1
Inglewood Recreation Park	(310) 412-5483	1 W Manchester Blvd	Park	0.3

Figure 2 Sensitive Population Receptors Within 0.5-Miles Radius



Date: 11/18/2008

Hazardous Materials Inventory Statement

Report #5316
Run By:

Business Name: SANFORD M ANDERSON WATER TREATMT PL
(Same as Facility Name or DBA) 359 N EUCALYPTUS AVE INGLEWOOD

Chemical Location: Unit # :
(Building/Storage Area) **ON SITE**

Facility ID # : FA0034778

1. Haz Class	2. Grid Coordinate	3. Common Name	Trade Secret	4. Hazardous Components (For mixtures only) Chemical Name	% Weight	EHS	CAS #	5. Type and Physical State	6. Quantities Max. Daily	Average Daily	Largest Cont.	7. Units	8. Storage Codes Storage Pressure	Storage Temp	9. Hazard Categories
		CHLORINE GAS						P	32,000	28,000	2,000.00	C	A	A	Y fire
Sub-Location		ON SITE							Curies (If radioactive)	Days On Site	Storage Container *				reactive
If EPCRA, sign :								G							Y pressure rels
EHS#:	RS: Y	CAS #: 7782-50-5								365	C				Y acute health
												Waste Code:	Amt:		Y chronic heal
															radioactive
		POTASSIUM PERMANGANATE						P	14	12	100.00	C	A	A	Y fire
Sub-Location		ON SITE							Curies (If radioactive)	Days On Site	Storage Container *				reactive
If EPCRA, sign :								S							pressure rels
EHS#:	RS: N	CAS #: 7722-64-7								365	R				acute health
												Waste Code:	Amt:		chronic heal
															radioactive
		AQUA AMMONIA		AMMO	29.0	Y	7664-41-7	M	5,500	3,500	220.00	C	A	A	fire
Sub-Location		ON SITE							Curies (If radioactive)	Days On Site	Storage Container *				reactive
If EPCRA, sign :								L							pressure rels
EHS#:	RS: Y	CAS #: 7664-41-7								365	A				acute health
												Waste Code:	Amt:		chronic heal
															radioactive

Components Not Necessary for Pure Chemical

* Code	Storage Type	Code	Storage Type	Code	Storage Type	Code	Storage Type	Code	Storage Type	Code	Storage Type
A	Aboveground Tank	D	Steel Drum	G	Carboy	J	Bag	M	Glass Bottle or Jug	P	Tank Wagon
B	Belowground Tank	E	Plastic/Non-metallic Drum	H	Silo	K	Box	N	Plastic Bottle or Jug	Q	Rail Car
C	Tank Inside Building	F	Can	I	Other Drum	L	Cylinder	O	Tote Bin	R	Other

Appendix F: Inglewood Unified School District for 2008-2009

ID	School	Address	Telephone	Fax	Principal	Enrollment
1	Bennet/Kew Elementary (K-5)	11710 S. Cherry Avenue, Inglewood, CA 90303	310-680-5400	310-680-5409	Ms. Kelly McGowans	723
2	Centinela Elementary (K-6)	1123 Marlborough Avenue, Inglewood, CA 90302	310-680-5440	310-680-5457	Ms. Loma Martin	870
3	Child Development Center/Latchkey/Head Start	10409 10th Ave, Inglewood, CA, 90302	310-419-2691	310-672-0720	Ms. Linda Anderson (Coordinator)	NA
4	City Honors High School	155 W. Kelso Street, Inglewood, CA, 90301	310-680-4880	310-680-5209	Ms. Thelma Brown	502
5	Crozier Middle School (6-8)	120 W. Regent Street, Inglewood, CA, 90301	310-680-5280	310-680-5295	Mr. Steve Donahue	1175
6	Daniel Freeman Elementary (K-6)	2602 W. 79th Street, Inglewood, CA, 90305	310-680-5380	310-680-5389	Ms. Geraldine Gamby-Turner	263
7	Highland Elementary (K-6)	430 Venice Way, Inglewood, CA 90302	310-680-5460	310-680-5478	Ms. Susan Ippongi	538
8	Hillcrest Continuation High School/Alternative Center	441 W. Hillcrest Blvd., Inglewood, CA 90301	310-680-5300	310-680-5308	Mr. Edward Brownlee	218
9	Hudnall Elementary (K-5)	331 W. Olive Street, Inglewood, CA 90301	310-680-5420	310-680-5428	Mr. Thomas Washington	406
10	Inglewood Adult School	106 E. Manchester Avenue, Inglewood, CA, 90301	310-330-5225	310-330-5243	Mr. Lacy Alexander	
11	Inglewood Alternative School (Opportunity, Outreach Independent Study, and Home/Hospital	441 W. Hillcrest Blvd., Inglewood, CA 90301	310-680-5122	310-680-4818	Mrs. Beverly Pye	NA
12	Inglewood Highschool (9-12)	231 s. Grevillea, Inglewood, CA, 90301	310-680-5200	310-680-5222	Ms. Debbie Tate	1698
13	Kelso Elementary (K-5)	809 E. Kelso St., Inglewood, CA 90301	310-680-5480	310-680-5489	Ms. Ugema Hosea-James	721
14	Warren Lane School (K-8)	9330 S. 8th Avenue, Inglewood, CA, 90305	310-680-5330	310-680-5336	Mr. Douglas Howard	568
15	La Tijera Elementary School (K-8)	1415 N. La Tijera Blvd, Inglewood, CA 90302	310-680-5260	310-680-5278	Dr. Judith Washington	449
16	Albert Monroe Middle School (6-8)	10711 10th Ave, Inglewood, CA 90303	310-680-5310	310-680-5319	Ms. Barbara Searcy	997
17	Morningside High School (9-12)	10500 S. Yukon Avenue, Inglewood, CA 90303	310-680-5230	310-680-5257	Mr. Michael Dennis	1175
18	Oak Street Elementary School (K-5)	633 S. Oak, Inglewood, CA, 90301	310-680-5340	310-680-5347	Mr. Richard Barter	752
19	Frank D. Parent (K-8)	5354 W. 64th St, Los Angeles, CA 90056	310-680-5430	310-680-5436	Mr. Gary Gregory	774
20	Beulah Payne Elementary (K-6)	215 W. 94th Street, Inglewood, CA 90301	310-680-5410	310-680-5418	Ms. Marie Blanco	727
21	Clyde Woodworth Elementary (K-5)	3200 W. 104th Street, Inglewood, CA 90303	310-680-5360	310-680-5378	Mrs. Josephine Taylor	546
22	Worthington Elementary (K-5)	11101 S. Yukon Ave., Inglewood, CA 90303	310-680-5350	310-680-5359	Ms. Angelina Marquez	702
23	Project Hope	Hillcrest Alternative Center, Rm 1, 441 W. Hillcrest Blvd., Inglewood, CA, 90301	310-680-5302	310-680-5308	Ms. Latonya Willis, Program Asst.	NA

Appendix G: Bridges in and around the City of Inglewood extracted from the National Bridge Inventory (NBI)

ID	Features Intersected	Facility Carried	Year Built	Lanes
53 1240	120TH STREET	ROUTE 405	1963	12
53 1242	LENNOX BLVD	INTERSTATE 405	1963	12
53 1243	CENTURY BLVD	INTERSTATE 405	1963	12
53 1241	IMPERIAL HIGHWAY	I 405	1963	11
53 2518	DOMINGUEZ CHANNEL	INTERSTATE 105	1992	10
53 2519	CRENSHAW BLVD	I 105 & LRT	1992	10
53 2598	YUKON AVENUE	I 105 & LRT	1992	10
53 2400	ROUTE 405,CONN,ST	ROUTE 105 & LRT	1991	8
53 2435	INGLEWOOD AVE	I 105	1993	8
53C0342	116TH ST STORM DRAIN	HAWTHORNE BLVD	1949	8
53 1246	ROUTE 405 & MNCHSTR-N405	MANCHESTER BLVD	1961	7
53 2432	I 105 & LRT	HAWTHORNE BLVD	1993	7
53 1251	ROUTE 405	LA TIJERA BLVD	1963	6
53 1466	N405-LA CIENEGA OFF RAMP	MANCHESTER BLVD	1961	6
53 2655	ROUTE 105 & LRT	IMPERIAL HIGHWAY	1993	6
53C0275	CENTINELA CREEK	LA TIJERA BLVD	1936	6
53 1244	ROUTE 405	ARBOR VITAE STREET	1963	5
53 1248	I 405 & NB RAMPS	FLORENCE AVENUE	1961	5
53 2517	I 105 & LRT	PRAIRIE AVE	1993	5
53 2520	I 105 & LRT	VAN NESS AVE	1988	4
53 2524	I 105 & LRT	WESTERN AVE	1988	4
53C1963	DOMINGUEZ CHANNEL	CRENSHAW BLVD	1990	4
53 1250	INTERSTATE 405	LA CIENEGA BLVD SB	1961	3
53 1522S	N405-MANCHESTER BL OFFRP	CENTURY BL-N405 ON	1963	3
53 2439S	E105-N405 & W105-N405 RP	N405-CENTURY BL OF	1989	3
53 1245	ROUTE 405	HILLCREST BLVD	1963	2
53 1249	ROUTE 405	LA CIENEGA BLVD NB	1961	2
53 1484S	N405-LA CIENEGA OFF-RAMP	MANCHESTER-N405 ON	1963	2
53 1521K	S405-CENTURY BLVD OFF-RP	OLIVE ST-S405 ONRP	1963	2
53 2442G	I 405,I 105, CONN	N405-W105 CONN OC	1991	2
53 2443H	I 405 & I 105, CONNS	S405-E105 CONNECTR	1991	2
53 2522	I 105 & LRT	WILTON PLACE	1988	2
53 2653K	DIRT	IMPERIAL HWY-N105	1993	2
53 2656S	I 105 & LRT	PRAIRIE AVE OFF-RP	1993	2
53 2686H	S405 ON AND OFF RAMPS	E&W105-S405 CONN	1989	2
53 2723S	I 405, ON-RAMPS	HUGHES PKWY-N405	1994	2
53 2724S	I 405, & ON- RAMPS	N405-HUGHES PKWY	1994	2
53 2803K	AIRPORT ACCESS ROAD	W105-NASH ST OFFRP	1989	2
53 2805G	LRT-GREEN LINE	E105-N&S405 CONN	1990	2
53 2829K	IMPERIAL HWY	LA CIENAGA-S405 ON	1994	2
53 2686H	S405 ON AND OFF RAMPS	E&W105-S405 CONN	1989	2
53 2434T	W105-N405 CONNECTOR RAMP	IMPERIAL HWY-N405	1989	1
53 2438F	IMPERIAL, LA CIENEGA, RP	S405-W105 CONNECTR	1994	1
53 2696G	FELTON ST & SUNDALE AVE	N405-E105 CONNECTR	1994	1

ID	Features Intersected	Facility Carried	Year Built	Lanes
53 2806S	DIRT	IMPERIAL-E105 ONRP	1989	1
53 2807K	DIRT	W105-IMPERIAL OFFR	1990	1
53 2436G	E105-S405 CONNECTOR RAMP	LA CIENEGA BLVD	1993	NA
53 0148	TELEPHONE UTILITIES	ROUTE 405	1961	NA
53 1247	BNSF RAIL ROAD	INTERSTATE 405	1961	NA
53 1465	CENTRAL OUTFALL	INTERSTATE 405	1961	NA
53 1511	SPRUCE AVE POC	INTERSTATE 405	1963	NA
53 2437G	ROUTE 405,RAMPS, STREETS	E105-N405 CONN TUN	1993	NA
53 2441F	ROUTE 405,RAMPS,IMPERIAL	W105-S405 CONN	1993	NA
53 2516	118 TH STREET POC	I 105	1993	NA
53 2739	POC	I 105	1991	NA
53 2808	LRT GREEN LINE	IMPERIAL E105 ONRA	1989	NA
53C1123	CENTURY BLVD UNDER AT&SF	AT&SF RR	1968	NA
53C1219	LA CIENEGA BLVD	LA CIENEGA BLD POC	1957	NA

Appendix H: HAZUS Damage States

Description of HAZUS® Building Damage States

Building damage varies from “none” to “complete” as a continuous function of building deformations (building response). Wall cracks may vary from invisible or “hairline cracks” to cracks of several inches wide. Generalized “ranges” of damage are used by the Methodology to describe structural and nonstructural damage, since it is not practical to describe building damage as a continuous function.

The Methodology predicts a structural and nonstructural damage state in terms of one of four ranges of damage or “damage states”: Slight, Moderate, Extensive, and Complete. For example, the Slight damage state extends from the threshold of Slight damage up to the threshold of Moderate damage. General descriptions of these damage states are provided for all model building types with reference to observable damage incurred by structural and nonstructural building components. Damage predictions resulting from this physical damage estimation method are then expressed in terms of the probability of a building being in any of these four damage states.

STRUCTURAL DAMAGE

Descriptions for Slight, Moderate, Extensive, and Complete structural damage states for the 16 basic model building types are provided below. For estimating casualties, the descriptions of Complete damage include the fraction of the total floor area of each model building type that is likely to collapse. Collapse fractions are based on judgment and limited earthquake data considering the material and construction of different model building types.

It is noted that in some cases the structural damage is not directly observable because the structural elements are inaccessible or not visible due to architectural finishes or fireproofing. Hence, these structural damage states are described, when necessary, with reference to certain effects on nonstructural elements that may be indicative of the structural damage state of concern. Small cracks are assumed, throughout this section, to be visible cracks with a maximum width of less than 1/8”. Cracks wider than 1/8” are referred to as “large” cracks.

Wood, Light Frame (W1):

Slight Structural Damage: Small plaster or gypsum-board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer.

Moderate Structural Damage: Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by

small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.

Extensive Structural Damage: Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of “room-over-garage” or other “soft-story” configurations; small foundations cracks.

Complete Structural Damage: Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks. Approximately 3% of the total area of W1 buildings with Complete damage is expected to be collapsed.

Wood, Commercial and Industrial (W2):

Slight Structural Damage: Small cracks at corners of door and window openings and wall-ceiling intersections; small cracks on stucco and plaster walls. Some slippage may be observed at bolted connections.

Moderate Structural Damage: Larger cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by cracks in stucco and gypsum wall panels; minor slack (less than 1/8” extension) in diagonal rod bracing requiring retightening; minor lateral set at store fronts and other large openings; small cracks or wood splitting may be observed at bolted connections.

Extensive Structural Damage: Large diagonal cracks across shear wall panels; large slack in diagonal rod braces and/or broken braces; permanent lateral movement of floors and roof; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of “soft-story” configurations; bolt slippage and wood splitting at bolted connections.

Complete Structural Damage: Structure may have large permanent lateral displacement, may collapse or be in imminent danger of collapse due to failed shear walls, broken brace rods or failed framing connections; it may fall its foundations; large cracks in the foundations. Approximately 3% of the total area of W2 buildings with complete damage is expected to be collapsed.

Steel Moment Frame (S1):

Slight Structural Damage: Minor deformations in connections or hairline cracks in few welds.

Moderate Structural Damage: Some steel members have yielded exhibiting observable permanent rotations at connections; few welded connections may exhibit major cracks through welds or few bolted connections may exhibit broken bolts or enlarged bolt holes.

Extensive Structural Damage: Most steel members have exceeded their yield capacity, resulting in significant permanent lateral deformation of the structure. Some of the structural members or connections may have exceeded their ultimate capacity exhibited by major permanent member rotations at connections, buckled flanges and failed connections. Partial collapse of portions of structure is possible due to failed critical elements and/or connections.

Complete Structural Damage: Significant portion of the structural elements have exceeded their ultimate capacities or some critical structural elements or connections have failed resulting in dangerous permanent lateral displacement, partial collapse or collapse of the building. Approximately 8%(low-rise), 5%(mid-rise) or 3%(high-rise) of the total area of S1 buildings with Complete damage is expected to be collapsed.

Steel Braced Frame (S2):

Slight Structural Damage: Few steel braces have yielded which may be indicated by minor stretching and/or buckling of slender brace members; minor cracks in welded connections; minor deformations in bolted brace connections.

Moderate Structural Damage: Some steel braces have yielded exhibiting observable stretching and/or buckling of braces; few braces, other members or connections have indications of reaching their ultimate capacity exhibited by buckled braces, cracked welds, or failed bolted connections.

Extensive Structural Damage: Most steel brace and other members have exceeded their yield capacity, resulting in significant permanent lateral deformation of the structure. Some structural members or connections have exceeded their ultimate capacity exhibited by buckled or broken braces, flange buckling, broken welds, or failed bolted connections. Anchor bolts at columns may be stretched. Partial collapse of portions of structure is possible due to failure of critical elements or connections.

Complete Structural Damage: Most the structural elements have reached their ultimate capacities or some critical members or connections have failed resulting in dangerous permanent lateral deflection, partial collapse or collapse of the building. Approximately 8%(low-rise), 5%(mid-rise) or 3%(high-rise) of the total area of S2 buildings with Complete damage is expected to be collapsed.

Steel Light Frame (S3):

These structures are mostly single story structures combining rod-braced frames in one direction and moment frames in the other. Due to repetitive nature of the structural systems, the type of damage to structural members is expected to be rather uniform throughout the structure.

Slight Structural Damage: Few steel rod braces have yielded which may be indicated by minor sagging of rod braces. Minor cracking at welded connections or minor deformations at bolted connections of moment frames may be observed.

Moderate Structural Damage: Most steel braces have yielded exhibiting observable significantly sagging rod braces; few brace connections may be broken. Some weld cracking may be observed in the moment frame connections.

Extensive Structural Damage: Significant permanent lateral deformation of the structure due to broken brace rods, stretched anchor bolts and permanent deformations at moment frame members. Some screw or welded attachments of roof and wall siding to steel framing may be broken. Some purlin and girt connections may be broken.

Complete Structural Damage: Structure is collapsed or in imminent danger of collapse due to broken rod bracing, failed anchor bolts or failed structural members or connections. Approximately 3% of the total area of S3 buildings with Complete damage is expected to be collapsed.

Steel Frame with Cast-In-Place Concrete Shear Walls (S4):

This is a “composite” structural system where primary lateral-force-resisting system is the concrete shear walls. Hence, slight, Moderate and Extensive damage states are likely to be determined by the shear walls while the collapse damage state would be determined by the failure of the structural frame.

Slight Structural Damage: Diagonal hairline cracks on most concrete shear wall surfaces; minor concrete spalling at few locations.

Moderate Structural Damage: Most shear wall surfaces exhibit diagonal cracks; some of the shear walls have exceeded their yield capacities exhibited by larger diagonal cracks and concrete spalling at wall ends.

Extensive Structural Damage: Most concrete shear walls have exceeded their yield capacities; few walls have reached or exceeded their ultimate capacity exhibited by large through-the wall diagonal cracks, extensive spalling around the cracks and visibly buckled wall reinforcement. Partial collapse may occur due to failed connections of steel framing to concrete walls. Some damage may be observed in steel frame connections.

Complete Structural Damage: Structure may be in danger of collapse or collapse due to total failure of shear walls and loss of stability of the steel frames. Approximately 8%(low-rise), 5%(mid-rise) or 3%(high-rise) of the total area of S4 buildings with Complete damage is expected to be collapsed.

Steel Frame with Unreinforced Masonry Infill Walls (S5):

This is a “composite” structural system where the initial lateral resistance is provided by the infill walls. Upon cracking of the infills, further lateral resistance is provided by the steel frames “braced” by the infill walls acting as diagonal compression struts. Collapse of the structure results when the infill walls disintegrate (due to compression failure of the masonry “struts”) and the steel frame loses its stability.

Slight Structural Damage: Diagonal (sometimes horizontal) hairline cracks on most infill walls; cracks at frame-infill interfaces.

Moderate Structural Damage: Most infill wall surfaces exhibit larger diagonal or horizontal cracks; some walls exhibit crushing of brick around beam-column connections.

Extensive Structural Damage: Most infill walls exhibit large cracks; some bricks may be dislodged and fall; some infill walls may bulge out-of-plane; few walls may fall off partially or fully; some steel frame connections may have failed. Structure may exhibit permanent lateral deformation or partial collapse due to failure of some critical members.

Complete Structural Damage: Structure is collapsed or in danger of imminent collapse due to total failure of many infill walls and loss of stability of the steel frames. . Approximately 8%(low-rise), 5%(mid-rise) or 3%(high-rise) of the total area of S5 buildings with Complete damage is expected to be collapsed.

Reinforced Concrete Moment Resisting Frames (C1):

Slight Structural Damage: Flexural or shear type hairline cracks in some beams and columns near joints or within joints.

Moderate Structural Damage: Most beams and columns exhibit hairline cracks. In ductile frames some of the frame elements have reached yield capacity indicated by larger flexural cracks and some concrete spalling. Nonductile frames may exhibit larger shear cracks and spalling.

Extensive Structural Damage: Some of the frame elements have reached their ultimate capacity indicated in ductile frames by large flexural cracks, spalled concrete and buckled main reinforcement; nonductile frame elements may have suffered shear

failures or bond failures at reinforcement splices, or broken ties or buckled main reinforcement in columns which may result in partial collapse.

Complete Structural Damage: Structure is collapsed or in imminent danger of collapse due to brittle failure of nonductile frame elements or loss of frame stability. Approximately 13%(low-rise), 10%(mid-rise) or 5%(high-rise) of the total area of C1 buildings with Complete damage is expected to be collapsed.

Concrete Shear Walls (C2):

Slight Structural Damage: Diagonal hairline cracks on most concrete shear wall surfaces; minor concrete spalling at few locations.

Moderate Structural Damage: Most shear wall surfaces exhibit diagonal cracks; some shear walls have exceeded yield capacity indicated by larger diagonal cracks and concrete spalling at wall ends.

Extensive Structural Damage: Most concrete shear walls have exceeded their yield capacities; some walls have exceeded their ultimate capacities indicated by large, through-the-wall diagonal cracks, extensive spalling around the cracks and visibly buckled wall reinforcement or rotation of narrow walls with inadequate foundations. Partial collapse may occur due to failure of nonductile columns not designed to resist lateral loads.

Complete Structural Damage: Structure has collapsed or is in imminent danger of collapse due to failure of most of the shear walls and failure of some critical beams or columns. Approximately 13%(low-rise), 10%(mid-rise) or 5%(high-rise) of the total area of C2 buildings with Complete damage is expected to be collapsed.

Concrete Frame Buildings with Unreinforced Masonry Infill Walls (C3):

This is a “composite” structural system where the initial lateral resistance is provided by the infill walls. Upon cracking of the infills, further lateral resistance is provided by the concrete frame “braced” by the infill acting as diagonal compression struts. Collapse of the structure results when the infill walls disintegrate (due to compression failure of the masonry “struts”) and the frame loses stability, or when the concrete columns suffer shear failures due to reduced effective height and the high shear forces imposed on them by the masonry compression struts.

Slight Structural Damage: Diagonal (sometimes horizontal) hairline cracks on most infill walls; cracks at frame-infill interfaces.

Moderate Structural Damage: Most infill wall surfaces exhibit larger diagonal or horizontal cracks; some walls exhibit crushing of brick around beam-column connections. Diagonal shear cracks may be observed in concrete beams or columns.

Extensive Structural Damage: Most infill walls exhibit large cracks; some bricks may dislodge and fall; some infill walls may bulge out-of-plane; few walls may fall partially or fully; few concrete columns or beams may fail in shear resulting in partial collapse. Structure may exhibit permanent lateral deformation.

Complete Structural Damage: Structure has collapsed or is in imminent danger of collapse due to a combination of total failure of the infill walls and nonductile failure of the concrete beams and columns. Approximately 15%(low-rise), 13%(mid-rise) or 5%(high-rise) of the total area of C3 buildings with Complete damage is expected to be collapsed.

Precast Concrete Tilt-Up Walls (PC1):

Slight Structural Damage: Diagonal hairline cracks on concrete shear wall surfaces; larger cracks around door and window openings in walls with large proportion of openings; minor concrete spalling at few locations; minor separation of walls from the floor and roof diaphragms; hairline cracks around metal connectors between wall panels and at connections of beams to walls.

Moderate Structural Damage: Most wall surfaces exhibit diagonal cracks; larger cracks in walls with door or window openings; few shear walls have exceeded their yield capacities indicated by larger diagonal cracks and concrete spalling. Cracks may appear at top of walls near panel intersections indicating “chord” yielding. Some walls may have visibly pulled away from the roof. Some welded panel connections may have been broken, indicated by spalled concrete around connections. Some spalling may be observed at the connections of beams to walls.

Extensive Structural Damage: In buildings with relatively large area of wall openings most concrete shear walls have exceeded their yield capacities and some have exceeded their ultimate capacities indicated by large, through-the-wall diagonal cracks, extensive spalling around the cracks and visibly buckled wall reinforcement. The plywood diaphragms may exhibit cracking and separation along plywood joints. Partial collapse of the roof may result from the failure of the wall-to-diaphragm anchorages sometimes with falling of wall panels.

Complete Structural Damage: Structure is collapsed or is in imminent danger of collapse due to failure of the wall-to-roof anchorages, splitting of ledgers, or failure of plywood-to-ledger nailing; failure of beams connections at walls; failure of roof or floor diaphragms; or, failure of the wall panels. Approximately 15% of the total area of PC1 buildings with Complete damage is expected to be collapsed.

Precast Concrete Frames with Concrete Shear Walls (PC2):

Slight Structural Damage: Diagonal hairline cracks on most shear wall surfaces; minor concrete spalling at few connections of precast members.

Moderate Structural Damage: Most shear wall surfaces exhibit diagonal cracks; some shear walls have exceeded their yield capacities indicated by larger cracks and concrete spalling at wall ends; observable distress or movement at connections of precast frame connections, some failures at metal inserts and welded connections.

Extensive Structural Damage: Most concrete shear walls have exceeded their yield capacities; some walls may have reached their ultimate capacities indicated by large, through-the wall diagonal cracks, extensive spalling around the cracks and visibly buckled wall reinforcement. Some critical precast frame connections may have failed resulting partial collapse.

Complete Structural Damage: Structure has collapsed or is in imminent danger of collapse due to failure of the shear walls and/or failures at precast frame connections. Approximately 15%(low-rise), 13%(mid-rise) or 10%(high-rise) of the total area of PC2 buildings with Complete damage is expected to be collapsed.

Reinforced Masonry Bearing Walls with Wood or Metal Deck Diaphragms (RM1):

Slight Structural Damage: Diagonal hairline cracks on masonry wall surfaces; larger cracks around door and window openings in walls with large proportion of openings; minor separation of walls from the floor and roof diaphragms.

Moderate Structural Damage: Most wall surfaces exhibit diagonal cracks; some of the shear walls have exceeded their yield capacities indicated by larger diagonal cracks. Some walls may have visibly pulled away from the roof.

Extensive Structural Damage: In buildings with relatively large area of wall openings most shear walls have exceeded their yield capacities and some of the walls have exceeded their ultimate capacities indicated by large, through-the-wall diagonal cracks and visibly buckled wall reinforcement. The plywood diaphragms may exhibit cracking and separation along plywood joints. Partial collapse of the roof may result from failure of the wall-to-diaphragm anchorages or the connections of beams to walls.

Complete Structural Damage: Structure has collapsed or is in imminent danger of collapse due to failure of the wall anchorages or due to failure of the wall panels. Approximately 13%(low-rise) or 10%(mid-rise) of the total area of RM1 buildings with Complete damage is expected to be collapsed.

Reinforced Masonry Bearing Walls with Precast Concrete Diaphragms (RM2):

Slight Structural Damage: Diagonal hairline cracks on masonry wall surfaces; larger cracks around door and window openings in walls with large proportion of openings.

Moderate Structural Damage: Most wall surfaces exhibit diagonal cracks; some of the shear walls have exceeded their yield capacities indicated by larger cracks.

Extensive Structural Damage: In buildings with relatively large area of wall openings most shear walls have exceeded their yield capacities and some of the walls have exceeded their ultimate capacities exhibited by large, through-the wall diagonal cracks and visibly buckled wall reinforcement. The diaphragms may also exhibit cracking

Complete Structural Damage: Structure is collapsed or is in imminent danger of collapse due to failure of the walls. Approximately 13%(low-rise), 10%(mid-rise) or 5%(high-rise) of the total area of RM2 buildings with Complete damage is expected to be collapsed.

Unreinforced Masonry Bearing Walls (URM):

Slight Structural Damage: Diagonal, stair-step hairline cracks on masonry wall surfaces; larger cracks around door and window openings in walls with large proportion of openings; movements of lintels; cracks at the base of parapets.

Moderate Structural Damage: Most wall surfaces exhibit diagonal cracks; some of the walls exhibit larger diagonal cracks; masonry walls may have visible separation from diaphragms; significant cracking of parapets; some masonry may fall from walls or parapets.

Extensive Structural Damage: In buildings with relatively large area of wall openings most walls have suffered extensive cracking. Some parapets and gable end walls have fallen. Beams or trusses may have moved relative to their supports.

Complete Structural Damage: Structure has collapsed or is in imminent danger of collapse due to in-plane or out-of-plane failure of the walls. Approximately 15% of the total area of URM buildings with Complete damage is expected to be collapsed.

Mobile Homes (MH):

Slight Structural Damage: Damage to some porches, stairs or other attached components.

Moderate Structural Damage: Major movement of the mobile home over its supports resulting in some damage to metal siding and stairs and requiring resetting of the mobile home on its supports.

Extensive Structural Damage: Mobile home has fallen partially off its supports, often severing utility lines.

Complete Structural Damage: Mobile home has totally fallen off its supports; usually severing utility lines, with steep jack stands penetrating through the floor. Approximately 3% of the total area of MH buildings with Complete damage is expected to be collapsed.

NONSTRUCTURAL DAMAGE

Four damage states are used to describe nonstructural damage: Slight, Moderate, Extensive and Complete nonstructural damage. Nonstructural damage is considered to be independent of the structural model building type (i.e. partitions, ceilings, cladding, etc. are assumed to incur the same damage when subjected to the same interstory drift or floor acceleration whether they are in a steel frame building or in a concrete shear wall building), consequently, building-specific damage state descriptions are not meaningful. Instead, general descriptions of nonstructural damage states are provided for common nonstructural systems.

Damage to drift-sensitive nonstructural components is primarily a function of interstory drift (e.g. full-height drywall partitions) while for acceleration-sensitive components (e.g. mechanical equipment) damage is a function of the floor acceleration. Developing fragility curves for each possible nonstructural component is not practicable for the purposes of regional loss estimation and there is insufficient data to develop such fragility curves. Hence, in this methodology nonstructural building components are grouped into drift-sensitive and acceleration-sensitive component groups, and the damage functions estimated for each group are assumed to be "typical" of it sub-components. Note, however, that damage depends on the anchorage/bracing provided to the nonstructural components. Damageability characteristics of each group are described by a set of fragility curves (see Subsection 5.4.3.3).

The type of nonstructural components in a given building is a function of the building occupancy-use classification. For example, single-family residences would not have curtain wall panels, suspended ceilings, elevators, etc. while these items would be found in an office building. Hence, the relative values of nonstructural components in relation to the overall building replacement value vary with type of occupancy. In Chapter 15, estimates of replacement cost breakdown between structural building components for different occupancy/use related classifications are provided; further breakdowns are provided by drift- and acceleration-sensitive nonstructural components.

In the following, general descriptions of the four nonstructural damage states are described for common nonstructural building components:

Partitions and Walls

Slight Nonstructural Damage: A few cracks are observed at intersections of walls and ceilings and at corners of door openings.

Moderate Nonstructural Damage: Larger and more extensive cracks requiring repair and repainting; some partitions may require replacement of gypsum board or other finishes.

Extensive Nonstructural Damage: Most of the partitions are cracked and a significant portion may require replacement of finishes; some door frames in the partitions are also damaged and require re-setting.

Complete Nonstructural Damage: Most partition finish materials and framing may have to be removed and replaced; damaged studs repaired, and walls refinished. Most door frames may also have to be repaired and replaced.

Suspended Ceilings

Slight Nonstructural Damage: A few ceiling tiles have moved or fallen down.

Moderate Nonstructural Damage: Falling of tiles is more extensive; in addition the ceiling support framing (T-bars) has disconnected and/or buckled at few locations; lenses have fallen off of some light fixtures and a few fixtures have fallen; localized repairs are necessary.

Extensive Nonstructural Damage: The ceiling system exhibits extensive buckling, disconnected t-bars and falling ceiling tiles; ceiling partially collapses at few locations and some light fixtures fall; repair typically involves removal of most or all ceiling tiles.

Complete Nonstructural Damage: The ceiling system is buckled throughout and/or fallen and requires complete replacement; many light fixtures fall.

Exterior Wall Panels

Slight Nonstructural Damage: Slight movement of the panels, requiring realignment.

Moderate Nonstructural Damage: The movements are more extensive; connections of panels to structural frame are damaged requiring further inspection and repairs; some window frames may need realignment

Extensive Nonstructural Damage: Most of the panels are cracked or otherwise damaged and misaligned, and most panel connections to the structural frame are

damaged requiring thorough review and repairs; few panels fall or are in imminent danger of falling; some window panes are broken and some pieces of glass have fallen.

Complete Nonstructural Damage: Most panels are severely damaged, most connections are broken or severely damaged, some panels have fallen and most are in imminent danger of falling; extensive glass breakage and falling.

Electrical-Mechanical Equipment, Piping, Ducts

Slight Nonstructural Damage: The most vulnerable equipment (e.g. unanchored or on spring isolators) moves and damages attached piping or ducts.

Moderate Nonstructural Damage: Movements are larger and damage is more extensive; piping leaks at few locations; elevator machinery and rails may require realignment

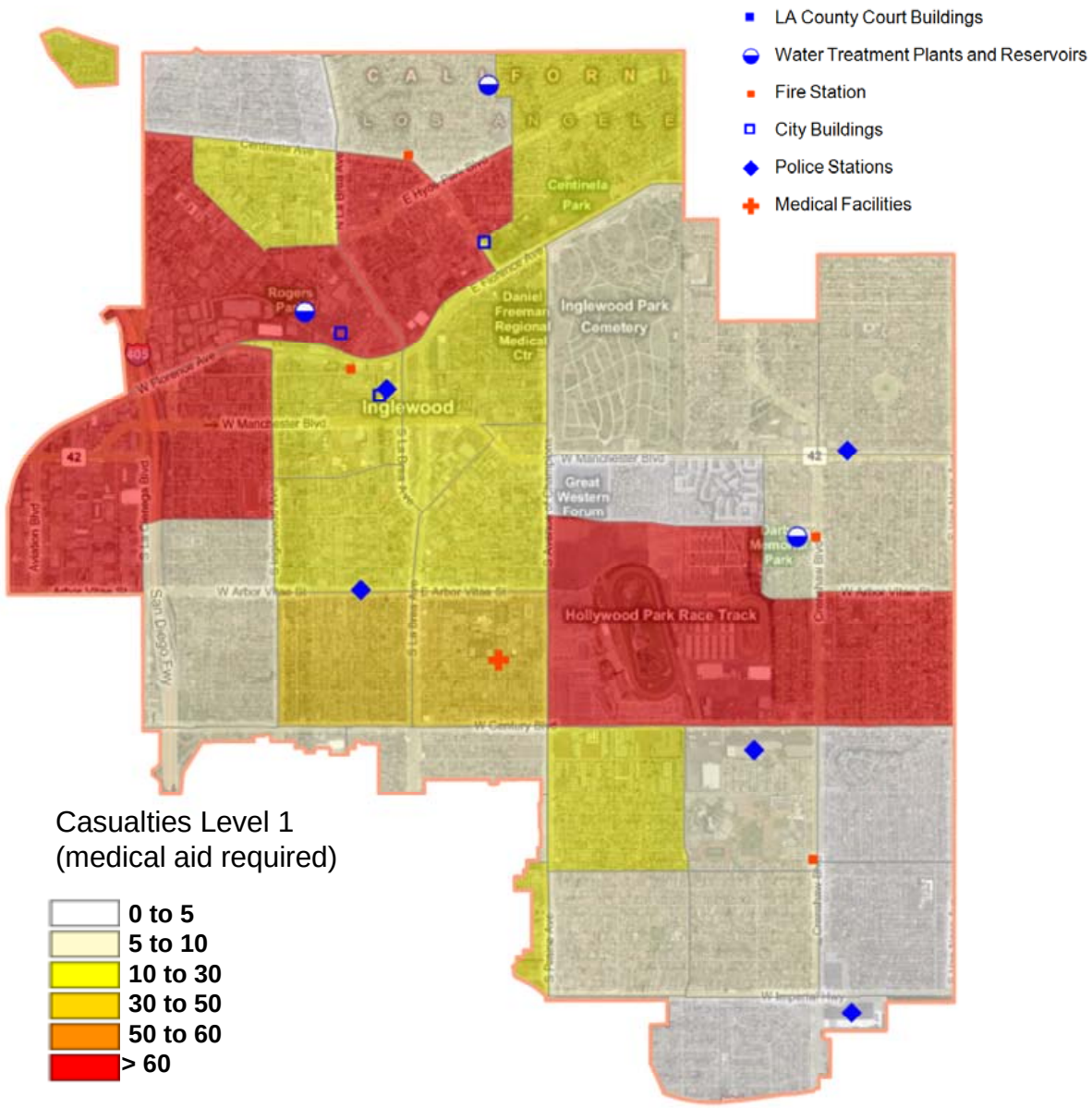
Extensive Nonstructural Damage: Equipment on spring isolators topples and falls; other unanchored equipment slides or falls breaking connections to piping and ducts; leaks develop at many locations; anchored equipment indicate stretched bolts or strain at anchorages.

Complete Nonstructural Damage: Equipment is damaged by sliding, overturning or failure of their supports and is not operable; piping is leaking at many locations; some pipe and duct supports have failed causing pipes and ducts to fall or hang down; elevator rails are buckled or have broken supports and/or counterweights have derailed.

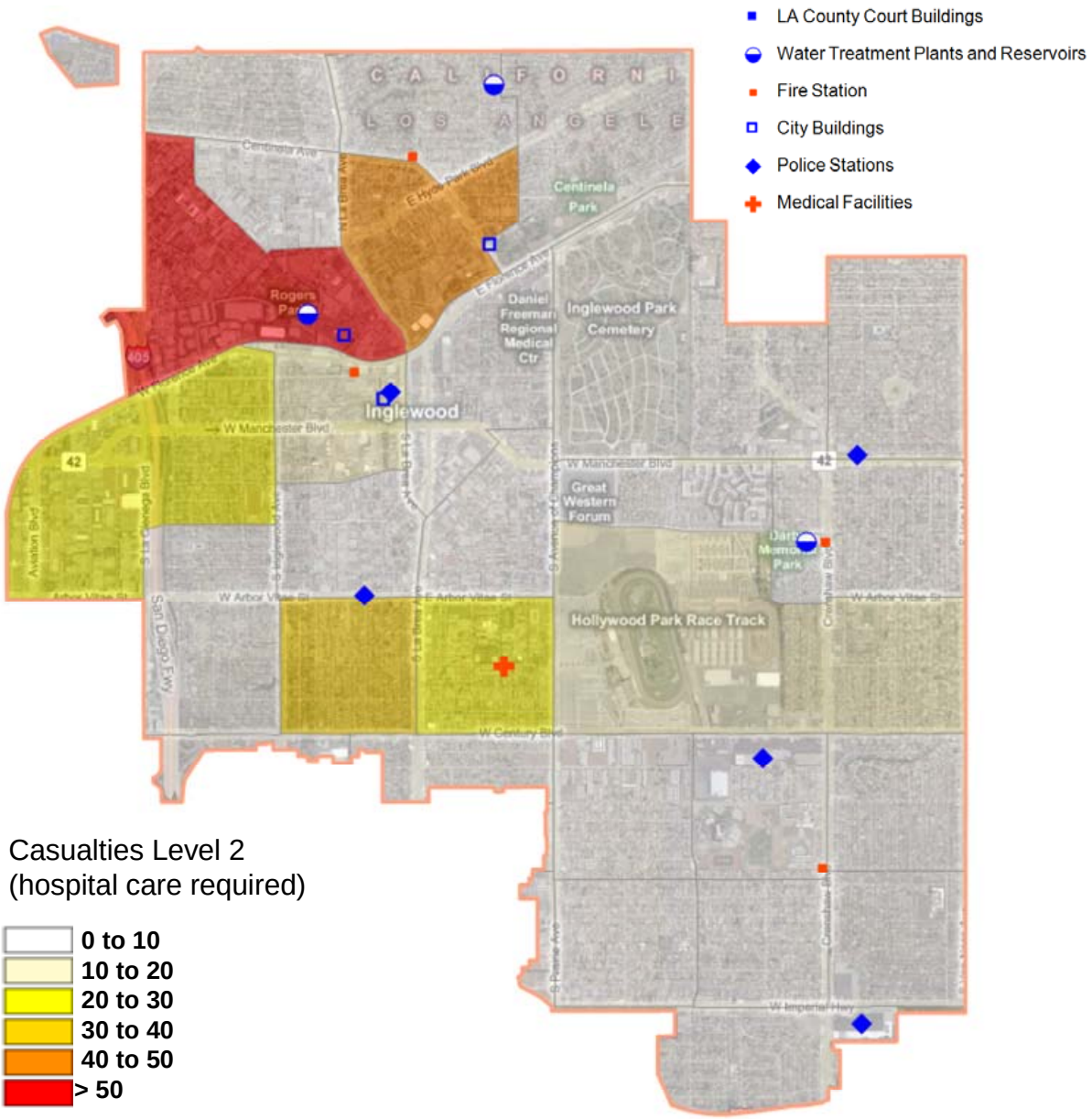
Appendix I: Maps

6.9 Newport-Inglewood Earthquake Scenario

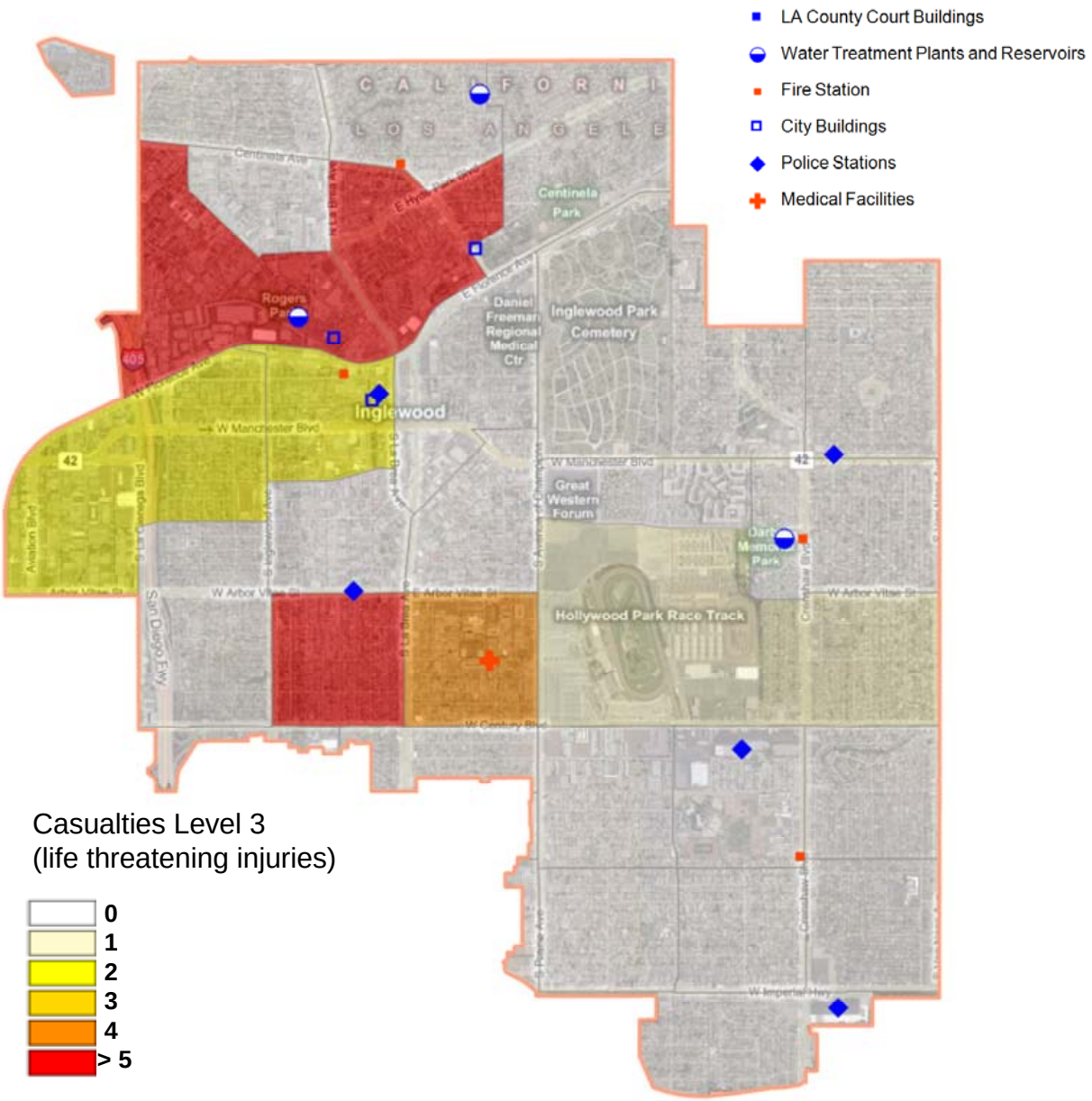
HAZUS® CASUALTY ESTIMATE MAPS: CASUALTY LEVEL 1



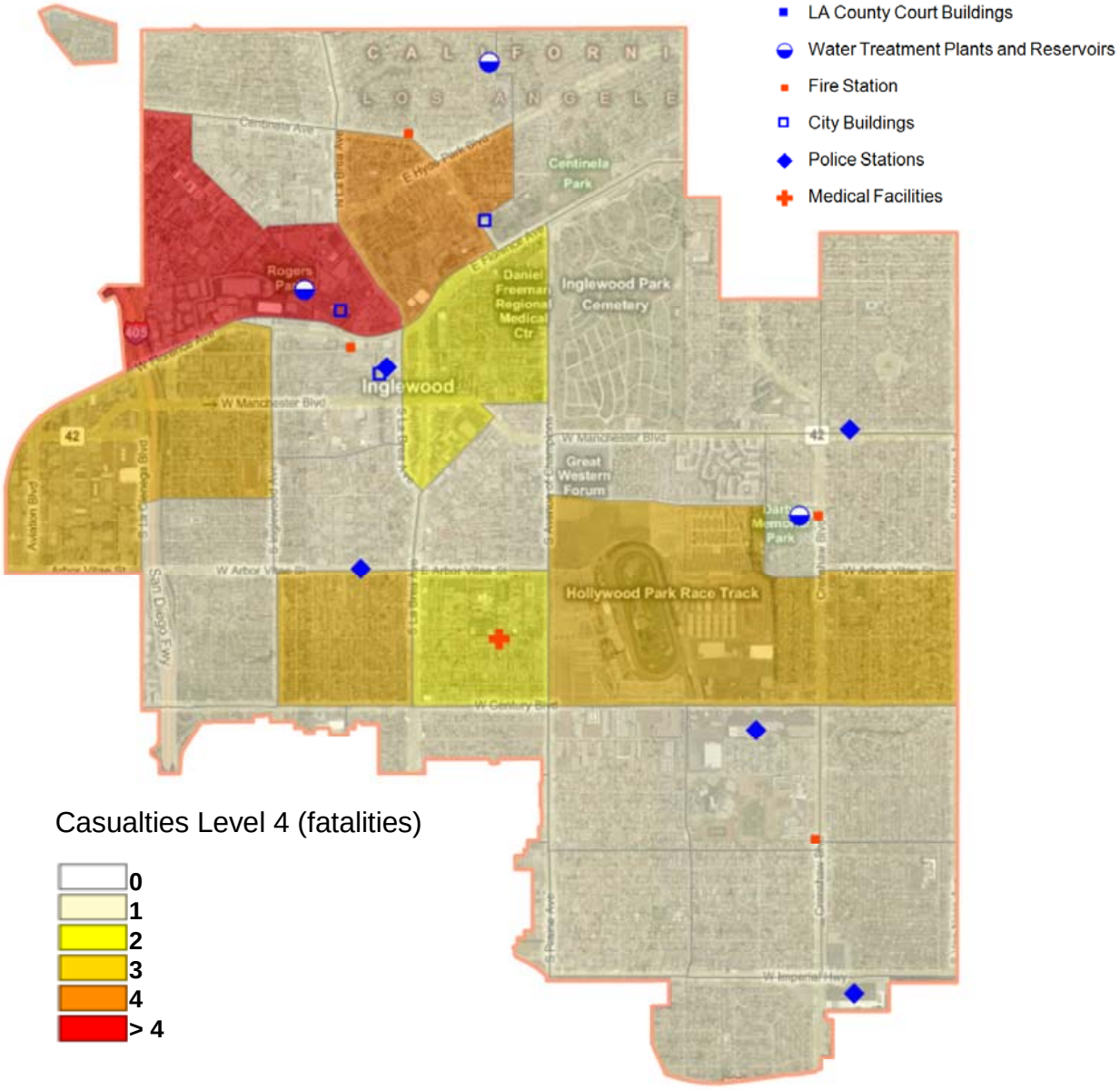
HAZUS® CASUALTY ESTIMATE MAPS: CASUALTY LEVEL 2



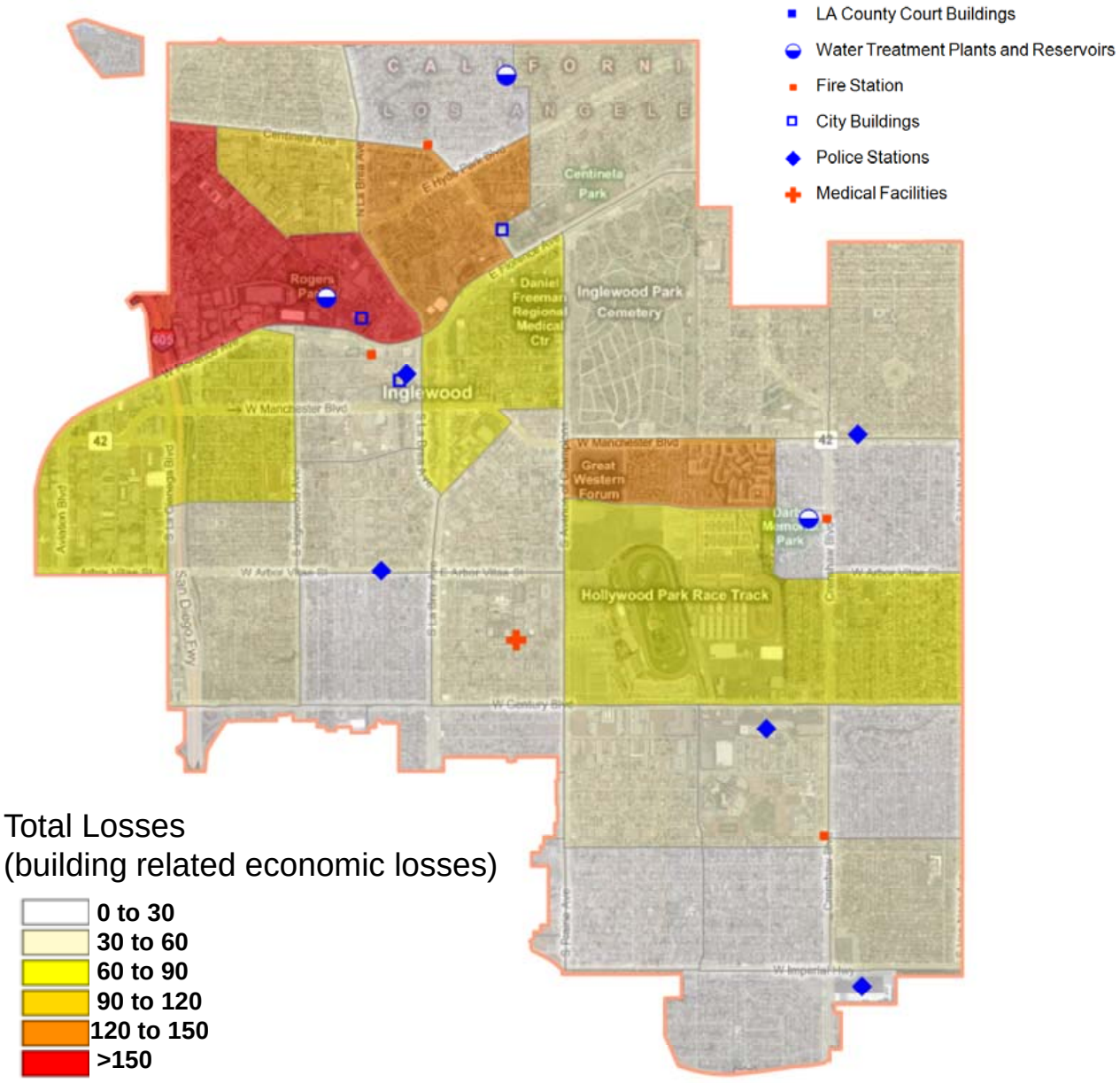
HAZUS® CASUALTY ESTIMATE MAPS: CASUALTY LEVEL 3



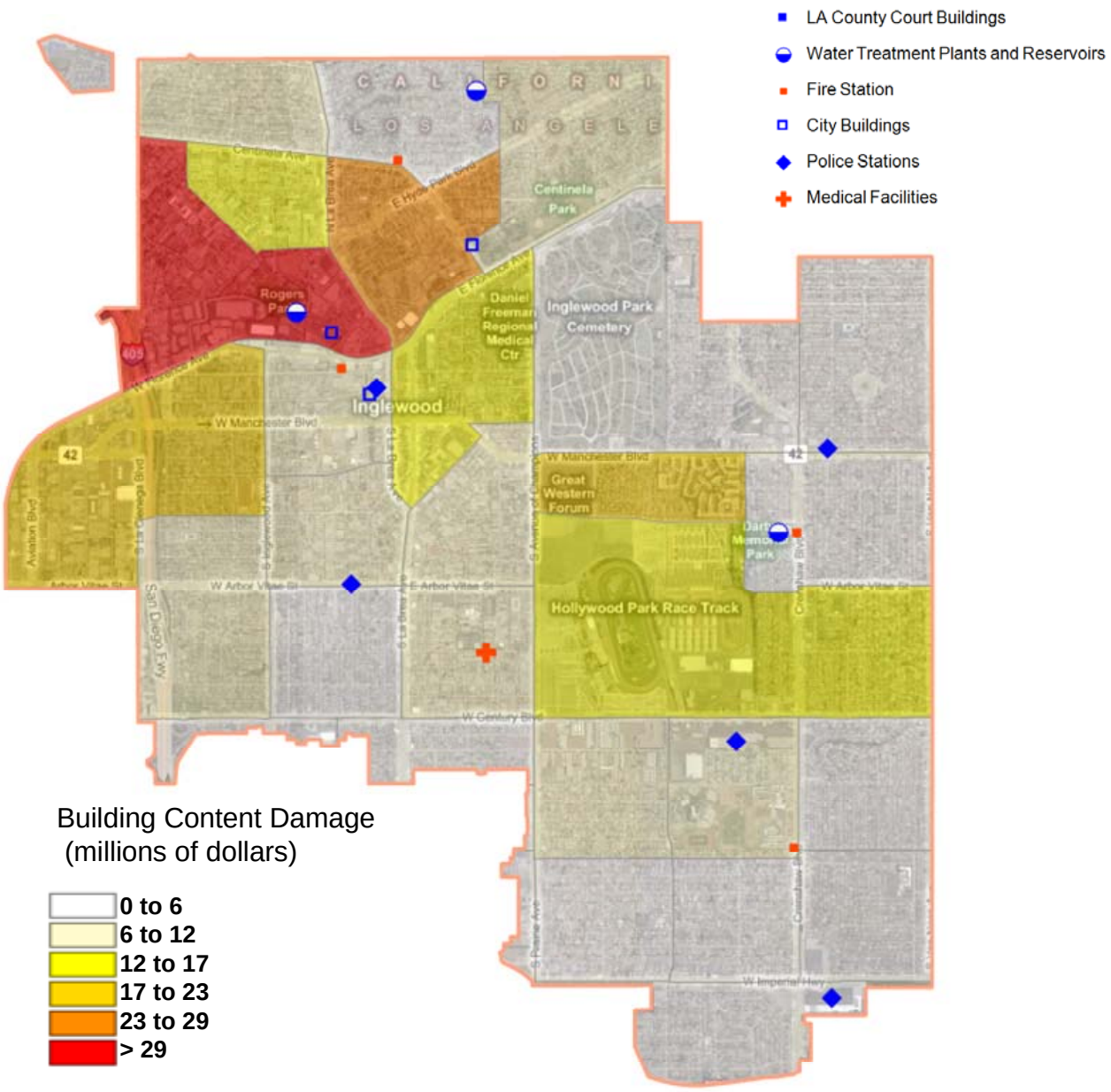
HAZUS® CASUALTY ESTIMATE MAPS: CASUALTY LEVEL 4



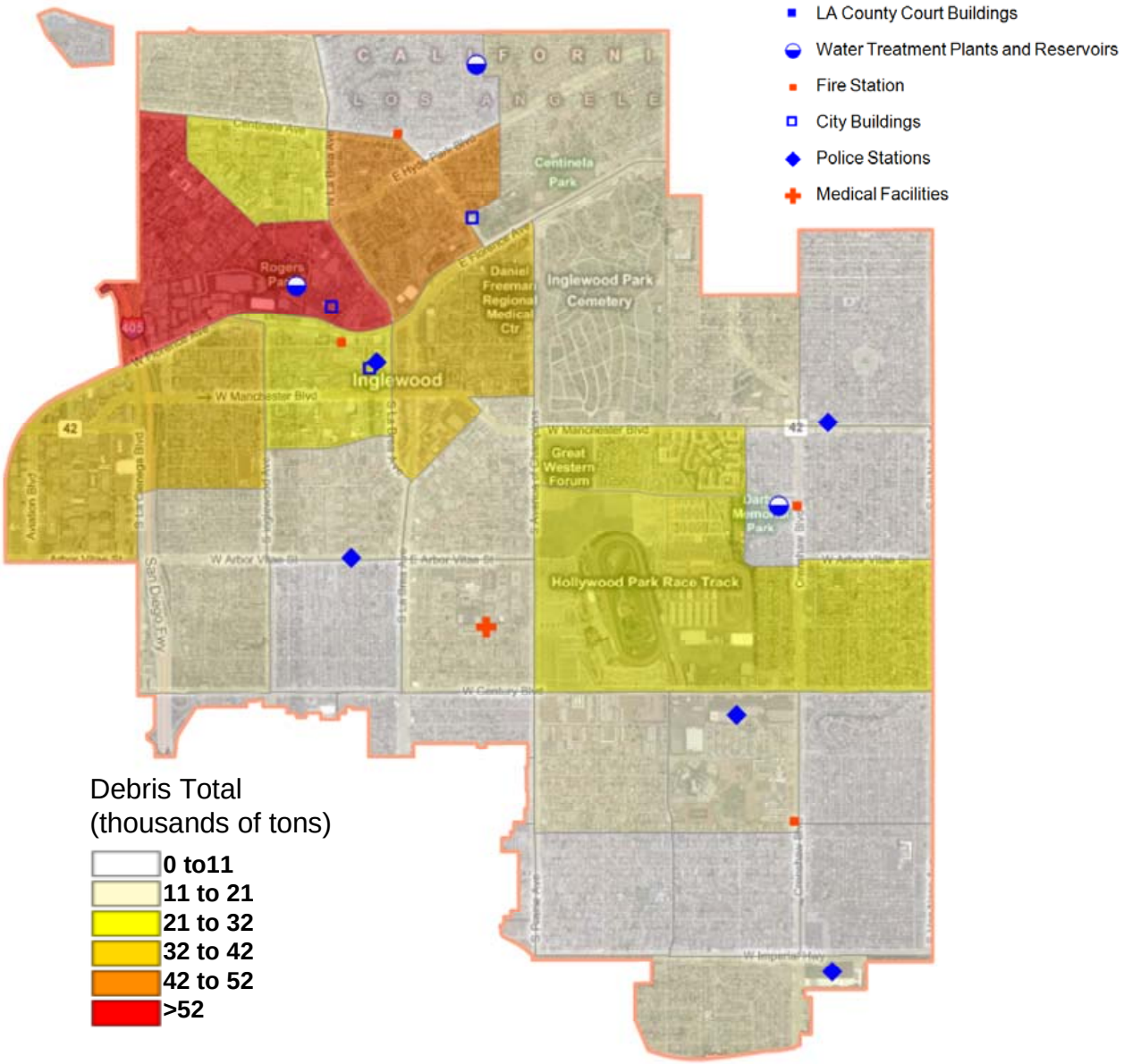
HAZUS® ECONOMIC LOSSES: TOTAL DIRECT BUILDING RELATED ECONOMIC LOSS
(Building and content damage, business interruption)



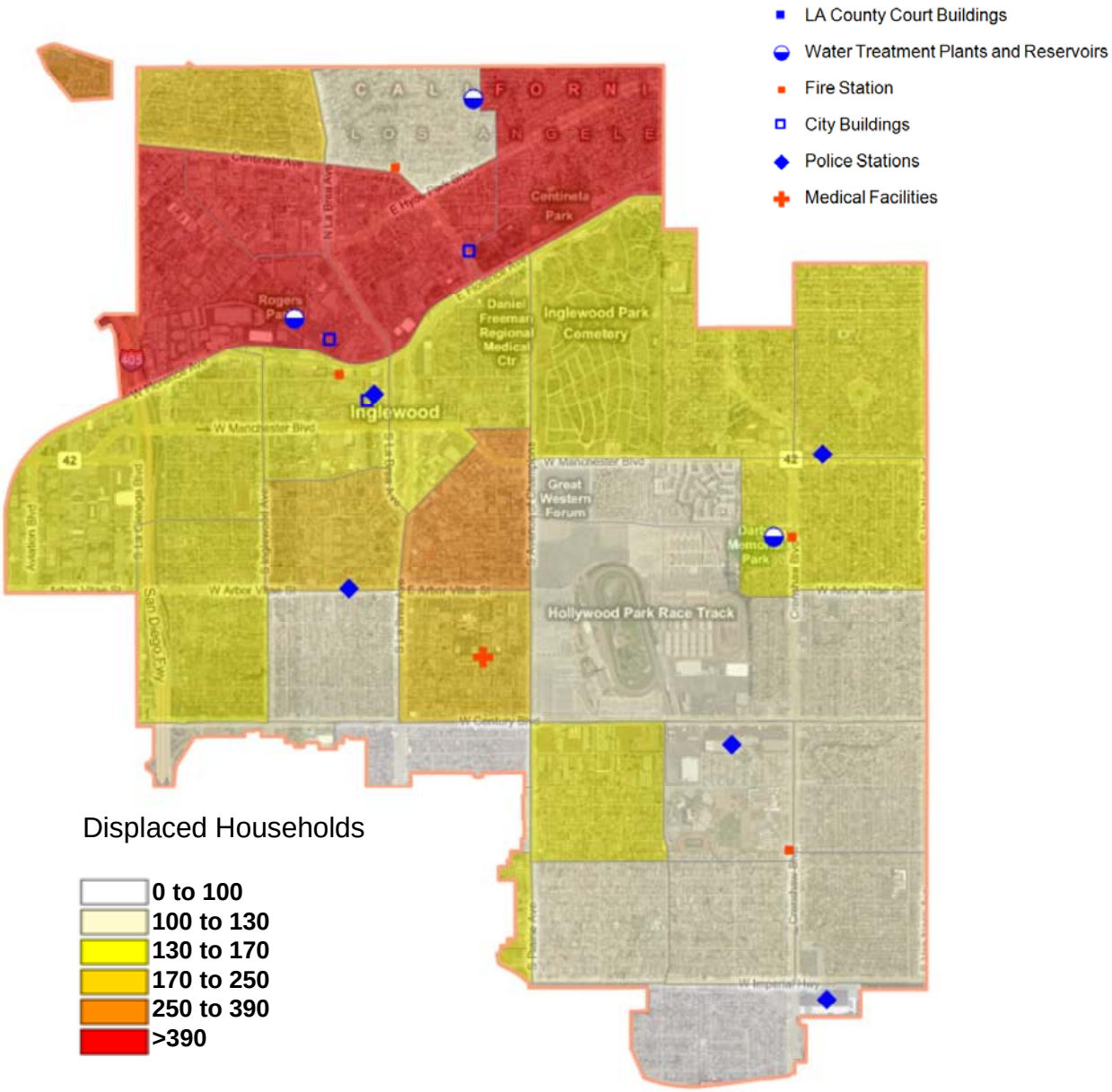
HAZUS® ECONOMIC LOSSES: BUILDING CONTENT LOSS



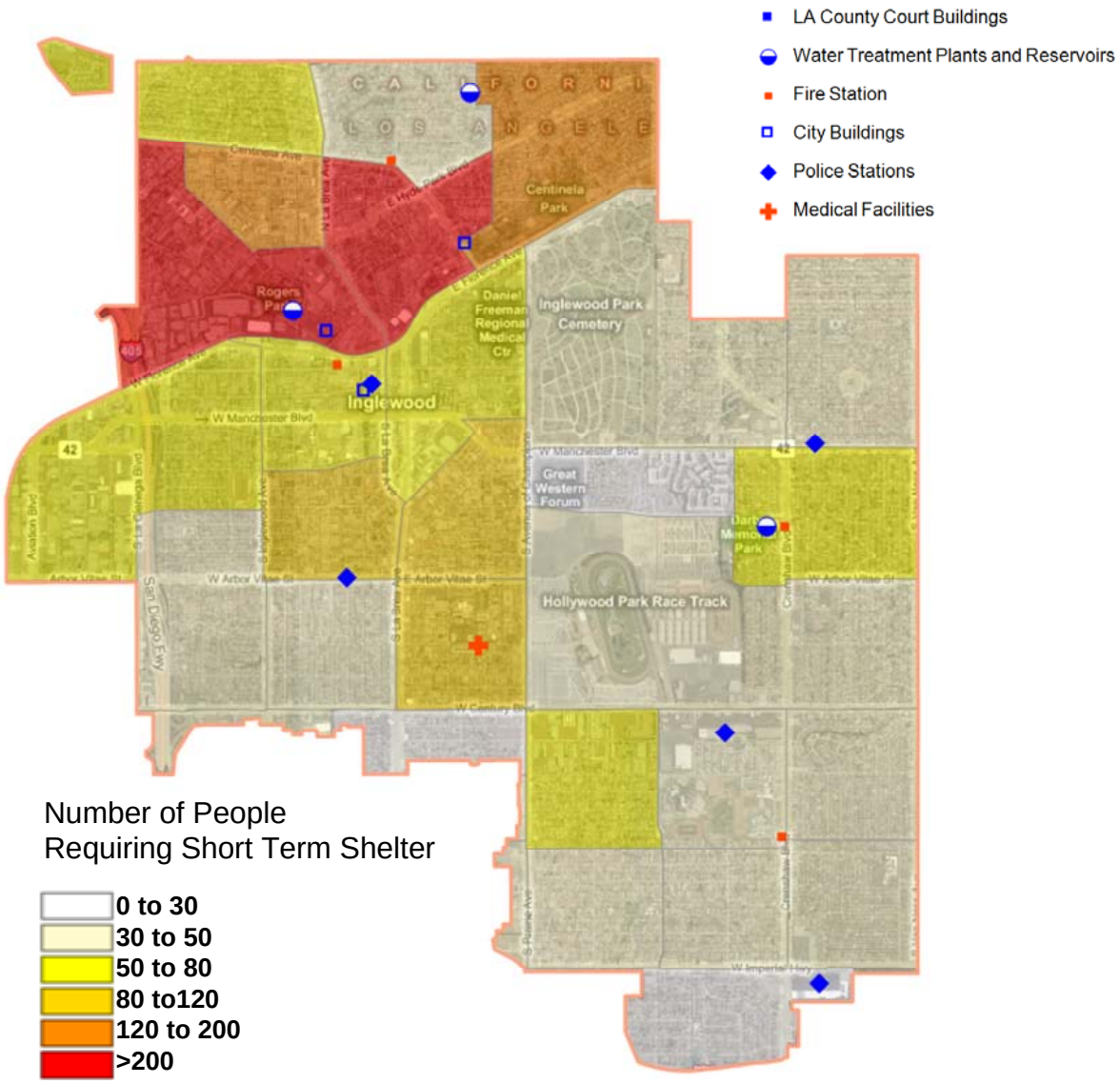
HAZUS® INDUCED DAMAGE: DEBRIS GENERATION



HAZUS® SOCIAL IMPACTS: DISPLACED HOUSEHOLD



HAZUS® SOCIAL IMPACTS: SHELTER REQUIREMENTS



Appendix J: HAZMAT Site List

Facilities on LUFT List for the City of Inglewood				
	Site Name	*Address*	*Substance*	*Status*
1	7-11 #24142	345 Manchester Blvd	Gasoline/Automotive	Closed
2	76 Products Station #2156	400 Arbor Vitae St W	Gasoline/Automotive	Closed
3	76 Products Station #3349	1430 La Brea Blvd N	Waste Oil/Used Oil	Open
4	Abacus Roof Corp	715 Centinela Ave	Gasoline/Automotive	Closed
5	Airline Coach Service	636 South La Brea Avenue	Waste Oil/Used Oil	Open
6	Airport Business Center	315 Glasgow Ave S	Waste Oil/Used Oil	Closed
7	Allright Self Storage	808 La Brea Ave	Aviation Gasoline And Additives	Closed
8	Arco #1360	1761 Centinela Ave	Gasoline/Automotive	Closed
9	Arco #1360	1761 Centinela Ave.	Gasoline/Automotive	Open
10	Arco #9645/Former Thrifty Oil #251	4130 Century Blvd W	Gasoline/Automotive	Open
11	Arco Products #09644	6500 S La Cienega	Gasoline/Automotive	Open
12	Buffington Motors	440 Market St N	Gasoline/Automotive	Closed
13	Cal National Guard Armory	111 Grosvenor St	Gasoline/Automotive	Closed
14	Carmax	355 South Glasgow Avenue	Diesel Fuel Oil And Additives	Open
15	Centinela Hospital Med. Ctr.	622 La Brea Ave N	Aviation Gasoline And Additives	Open
16	Century Mobil	1244 Inglewood Ave S	Gasoline/Automotive	Open
17	Century Park Cleaners	3201 Century Blvd W	Aviation Gasoline And Additives	Closed
18	Chevron	1358 Centinela Ave	Gasoline/Automotive	Closed
19	Chevron # 9-0017	1300 Centinela Ave	Gasoline/Automotive	Closed
20	Chevron #9-0017	1300 Centinela Ave	Gasoline/Automotive	Closed
21	Chevron #9-1244	8409 8th Ave	Gasoline/Automotive	Closed
22	Chevron #9-3829	303 Manchester Blvd W	Waste Oil/Used Oil	Closed
23	Chevron #9-6594	2600 Manchester Blvd E	Waste Oil/Used Oil	Open
24	Chevron #9-8503	11400 Crenshaw Blvd	Gasoline/Automotive	Closed
25	Chevron Service Station # 9-3829	303 Manchester Blvd. W.	8006619,71432,Mtbe	Open
26	City Of Inglewood Maint. Yard	222 Beach Ave W	Gasoline/Automotive	Closed
27	Colling Trust Property	9117 Aviation Blvd	Hydrocarbons	Open
28	Collins Trust	9121 Aviation Blvd	Hydrocarbons	Closed
29	Cypress Fee Pit	12001 Forum Rd	Waste Oil/Used Oil	Open
30	Daniel Freeman Hospital	333 Prairie Ave N	Diesel fuel oil and additives	Closed
31	Delorme Chevrolet	1175 La Brea Ave S	Waste Oil/Used Oil	Closed
32	Dombrowski's Flowers	4940 Century Blvd W	Gasoline/Automotive	Closed
33	El Amin's Automotive Site	1001 Hyde Park Blvd E	Gasoline/Automotive	Closed
34	Emery World Wide	3600 Century Blvd W	Hydrocarbons	Open
35	Emery Worldwide	3600 Century Blvd W	Diesel Fuel Oil And Additives	Closed
36	Exxon #7-2571 (Former)	3102 Century Blvd W	Gasoline/Automotive	Closed
37	Exxon #7-4181	633 Manchester Blvd W	Gasoline/Automotive	Closed
38	Family Of Faith Church	400 Florence Ave W	Gasoline/Automotive	Closed
39	Fast Fuel #77 / Texaco-Former	3754 Imperial Hwy W	Gasoline/Automotive	Open
40	Freight Forwarders (Formerly)	9107 Aviation Bl S	Gasoline/Automotive	Closed

Facilities on LUFT List for the City of Inglewood				
	Site Name	*Address*	*Substance*	*Status*
41	Fritz Foreign Service	4501 West Century Boulevard	Waste Oil/Used Oil	Open
42	Fujita Corporation	230 La Brea Ave. N.	Gasoline/Automotive	Open
43	Global Gasoline	10800 S Prairie Ave	Gasoline/Automotive	Open
44	Great Western Forum	3900 Manchester Blvd W	Gasoline/Automotive	Closed
45	Harry's Airport Garage	9131 Aviation Blvd S	Gasoline/Automotive	Open
46	Holly Park Car Wash	3350 Century Blvd W	Gasoline/Automotive	Open
47	Inglewood Car Wash	320 La Brea Ave N	Gasoline/Automotive	Closed
48	Inglewood Park Cemetery	720 Florence Ave E	Aviation Gasoline And Additives	Closed
49	Inglewood Redevelopment Agency	3250 Century Blvd W	Gasoline/Automotive	Closed
50	Inglewood Transmission, Inc	4919 West Century Blvd	Gasoline/Automotive	Open
51	Jim Lynch Cadillac	1213 Centinela Ave	Waste Oil/Used Oil	Closed
52	Lax Equipment	830 West Florence Avenue	Diesel Fuel Oil And Additives	Open
53	Levine Family Trust	815 Hyde Park Ave W	Aviation Gasoline and Additives	Closed
54	Lincoln Discount Tire	868 La Brea Ave S	Waste Oil/Used Oil	Closed
55	Mobil #11-Apj	3016 Century Blvd W	Gasoline/Automotive	Open
56	Mobil #11-Kkx	8600 Crenshaw Blvd S	Waste Oil/Used Oil	Closed
57	Mobil #18-Kkx	8600 Crenshaw Blvd S	Hydrocarbons	Closed
58	Mobil #18-Len	8307 La Cienega Blvd S	Gasoline/Automotive	Open
59	Mobil 18-Gj4	1007 La Brea Ave N	Gasoline/Automotive	Open
60	P & M #0021	1100 Manchester Blvd W	Hydrocarbons	Open
61	Park's Auto	4760 Imperial Hwy W	Gasoline/Automotive	Open
62	Prince Chrysler Plymouth	1030 Manchester W	Waste Oil/Used Oil	Closed
63	Ramar Industries	426 East 99th Street	Gasoline/Automotive	Open
64	Rent A Car Cheap	4858 Century Blvd W	Gasoline/Automotive	Closed
65	Rho-Chem Corporation	425 Isis Ave	Solvents	Open
66	Sears Auto Center (Former)	500 Manchester Blvd E	Gasoline/Automotive	Closed
67	Shell	1135 Manchester Blvd W	Waste Oil/Used Oil	Open
68	Shell Service Station	6800 Prairie Ave S	Hydrocarbons	Open
69	Shell Service Station	804 Manchester Blvd W.	8006619, 76 MTBE	Closed
70	Simons Mini Market	501 Manchester Ave E	Gasoline/Automotive	Open
71	Southern California Edison	8611 La Cienega Blvd	Gasoline/Automotive	Closed
72	Sparling Buick	737 La Brea Ave N	Gasoline/Automotive	Closed
73	Ss #23552	435 La Brea Ave N	Aviation Gasoline And Additives	Closed
74	Texaco Gas Food Mart	1235 Centinela Ave	Gasoline/Automotive	Open
75	Tire World (Former Arco)	920 Manchester Blvd W	Gasoline/Automotive	Open
76	Tosco - 76 Station #2365	8600 Aviation Blvd	Gasoline/Automotive	Open
77	Tosco S.S. #2900	9830 Crenshaw Blvd S	Gasoline/Automotive	Open
78	Toyota Of Inglewood	700 La Brea Ave S	Gasoline/Automotive	Closed
79	Transit Mixed Concrete Company	505 Railroad Pl	Diesel Fuel Oil And Additives	Closed
80	Trustees Of The Highland Street Connection	11950 Aviation Blvd.	8006619,13 Mtbe	Closed

Facilities on LUFT List for the City of Inglewood				
	Site Name	*Address*	*Substance*	*Status*
81	United Oil #57	4520 Century Blvd W	Gasoline/Automotive	Open
82	Unocal #1923	145 Manchester Blvd E	Waste Oil/Used Oil	Closed
83	Unocal #3145	3101 Imperial Hwy W	Gasoline/Automotive	Closed
84	Unocal #3836	1740 Centinela Ave	Waste Oil/Used Oil	Closed
85	Unocal #5050 (Former)	4000 Century Blvd W	Gasoline/Automotive	Closed
86	Unocal #5771	843 La Brea Ave S	Gasoline/Automotive	Closed
87	Unocal #6370	4760 Century Blvd W	Gasoline/Automotive	Open
88	Van's Shell #2	3107 Manchester Blvd W	Hydrocarbons	Open
89	World Oil #15	740 Centinela Ave	Gasoline/Automotive	Open
90	Your Man Tour	8831 Aviation Blvd	Diesel Fuel Oil And Additives	Closed

Appendix K: HAZMAT Deaths

Type	5 Yr. Average	General Population[b] Risk Per Year	Risk Based on Exposure or Other Measures
Motor Vehicle[5]	36,676	1 out of 7,700	1.3 deaths per 100 million vehicle miles [c,d]
Poisoning [9]	15,206	1 out of 18,700	
Work Related [7]	5,800	1 out of 49,000	4.3 deaths per 100,000 workers
Large Trucks [5]	5,150	1 out of 55,000	2.5 deaths per 100 million vehicle miles
Pedestrian [5]	4,846	1 out of 58,000	
Drowning [9]	3,409	1 out of 83,500	
Fires [9]	3,312	1 out of 86,000	
Motorcycles [5]	3,112	1 out of 91,500	31.3 deaths per 100 million vehicle miles
Railroads [3]	931	1 out of 306,000	1.3 deaths per million train miles
Firearms [9]	779	1 out of 366,000	
Recreational Boating [8]	714	1 out of 399,000	5.6 deaths per 100,000 registered boats
Bicycles [5]	695	1 out of 410,000	
Electric Current [10]	410	1 out of 695,000	
Air Carriers [2]	138[a]	1 out of 2,067,000	1.9 deaths per 100 million aircraft miles
Flood [4]	58	1 out of 4,928,000	
Tornado [4]	57	1 out of 5,015,000	
Lightning [4]	47	1 out of 6,061,000	
HAZMAT Transportation [1]	12	1 out of 23,350,000	4.2 deaths per 100 million shipments

Accidental Deaths - United States - 1999-2003

Notes:

1. *Hazardous Materials Incident Data, Department of Transportation, Pipeline and Hazardous Materials Safety Administration.*
2. *National Transportation Statistics, Department of Transportation's Bureau of Transportation Statistics. Air carrier data was calculated for all air carriers operating under either 14 CFR 121 or 14 CFR 135. Data used in this comparison was from air carriers operating under 14 CFR 121, which includes large aircraft, and under 14 CFR 135, which includes aircraft with less than 10 seats. Passenger and cargo aircraft are included in both categories.*
3. *National Transportation Statistics, Department of Transportation's Bureau of Transportation Statistics. Railroad fatality statistics include railroad only fatalities and grade crossing fatalities. Mileage data used was for Railroad System Safety and Property Damage Data.*

4. *U.S. Natural Hazard Statistics, National Weather Service. The National Weather Service is a program of the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA).*
5. *Traffic Safety Facts 2004, Department of Transportation's National Highway Traffic Safety Administration. Motor vehicle fatalities are limited to occupant fatalities and exclude related fatalities to pedestrians, bicyclists, and others. On average, including fatalities to other than motor vehicle occupants in motor vehicle accidents would add approximately 5,500 fatalities to the motor vehicle fatality total. Large trucks are defined as having a gross vehicle weight greater than 10,000 pounds. Truck related fatalities are also counted in the overall motor vehicle category. FHWA-RD-89-013, Present Practices of Highway Transportation of Highway Material, Harwood and Russell, indicates about 5% of truck accidents reported to the FHWA involved trucks carrying hazardous materials. Applying this percentage to overall hazardous materials transportation yields a risk of about 260 fatalities related to general truck transportation risk apart from risks related to the particular hazards of the materials themselves.*
6. *Fatality data obtained from the Census of Fatal and Occupational Injuries, Department of Labor's Bureau of Labor Statistics (2003 and 1999-2002). Workforce data obtained from the Current Population Survey, Department of Labor's Bureau of Labor Statistics. Workforce risk calculated using the total employed civilian work force.*
7. *Boating Statistics – 2003, United States Coat Guard.*
8. *WISQARS (Web-based Injury Statistics Query and Reporting System) Injury Mortality Reports 1999 - 2003, Department of Health and Human Services' Centers for Disease Control and Prevention. Only unintentional fatalities were used in this report. Fire data was limited to fire/flame fatalities and excluded fatalities due to contact with hot objects/substances.*
9. *Injury Facts, National Safety Council. 2004, 2005/2006, and 2007 editions used to compile data.*
    a. *Other than the persons aboard the aircraft who were killed, fatalities resulting from the September 11 terrorist acts are excluded.*
    b. *An average of approximately 285,000,000 over the period was used in computations.*
    c. *Deaths per passenger mile should also be considered as a basic risk measure when comparing risks amongst various modes of transportation. Since the average number of passengers in an aircraft far exceeds the average number of passengers in a motor vehicle, the passenger mile risk of air carrier transportation is significantly less than that of motor vehicle transportation.*
    d. *The fatality rate in currently about 1.3 fatalities per 100,000,000 vehicle miles in 1999-2003, or about 1 fatality per 77,000,000 miles. Another way of looking at this is that if a person drove about 770,000 miles in their lifetime (15,500 miles per year for 50 years), there is about 1 in 100 chance that person will die as a result of an automobile accident during their lifetime.*