

Final Draft Plan

May 10, 2018

Hazard Mitigation Plan



Q&A | ELEMENT A: PLANNING PROCESS | A1c.

Q: Does the plan identify who represented each jurisdiction? (At a minimum, it must identify the jurisdiction represented and the person's position or title and agency within the jurisdiction.) (Requirement §201.6(c)(1))

A: See **Credits** below.

Credits

Special Thanks

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Acknowledgements

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- ✓ Jay Sarno, Mayor Pro Tem
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Mapping

The maps in this plan were provided by the City of Santa Fe Springs, County of Los Angeles, Federal Emergency Management Agency (FEMA), or were acquired from public Internet sources. Care was taken in the creation of the maps contained in this Plan, however they are provided "as is". The City of Santa Fe Springs cannot accept any responsibility for any errors, omissions or positional accuracy, and therefore, there are no warranties that accompany these products (the maps). Although information from land surveys may have been used in the creation of these products, in no way does this product represent or constitute a land survey. Users are cautioned to field verify information on this product before making any decisions.

Mandated Content

In an effort to assist the readers and reviewers of this document, the jurisdiction has inserted "markers" emphasizing mandated content as identified in the Disaster Mitigation Act of 2000 (Public Law – 390). Following is a sample marker:

EXAMPLE

Q&A | ELEMENT A: PLANNING PROCESS | A1

Q: Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

A:

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Part I: PLANNING PROCESS

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | A1b.

Q: Does the plan list the jurisdiction(s) participating in the plan that are seeking approval?
(Requirement §201.6(c)(1))

A: See **Introduction** below.

Introduction

The Hazard Mitigation Plan (Mitigation Plan) was prepared in response to Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) requires state and local governments to prepare mitigation plans to document their mitigation planning process, and identify hazards, potential losses, mitigation needs, goals, and strategies. This type of planning supplements the City's comprehensive land use planning and emergency management planning programs. The City of Santa Fe Springs created a Planning Team charged with the responsibility of creating a Hazard Mitigation Plan. The Team submitted a draft plan to City Council and FEMA back in 2009 however, the plan was not approved, and the project's completion significantly postponed. Therefore, this is the City's first Hazard Mitigation Plan.

DMA 2000 was designed to establish a national program for pre-disaster mitigation, streamline disaster relief at the federal and state levels, and control federal disaster assistance costs. Congress believed these requirements would produce the following benefits:

- ✓ Reduce loss of life and property, human suffering, economic disruption, and disaster costs.
- ✓ Prioritize hazard mitigation at the local level with increased emphasis on planning and public involvement, assessing risks, implementing loss reduction measures, and ensuring critical facilities/services survive a disaster.
- ✓ Promote education and economic incentives to form community-based partnerships and leverage non-federal resources to commit to and implement long-term hazard mitigation activities.

The following FEMA definitions are used throughout this plan (Source: FEMA, 2002, *Getting Started, Building Support for Mitigation Planning*, FEMA 386-1):

Hazard Mitigation – "Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards".

Planning – "The act or process of making or carrying out plans; specifically, the establishment of goals, policies, and procedures for a social or economic unit."

Planning Approach

The four-step planning approach outlined in the FEMA publication, *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3) was used to develop this plan:

- ✓ **Develop mitigation goals and objectives** - The risk assessment (hazard characteristics, inventory, and findings), along with municipal policy documents, were utilized to develop mitigation goals and objectives.
- ✓ **Identify and prioritize mitigation actions** - Based on the risk assessment, goals and objectives, existing literature/resources, and input from participating entities, mitigation activities were identified for each hazard. Activities were 1) qualitatively evaluated against the goals and objectives, and other criteria; 2) identified as high, medium, or low priority; and 3) presented in a series of hazard-specific tables.
- ✓ **Prepare implementation strategy** - Generally, high priority activities are recommended for implementation first. However, based on community needs and goals, project costs, and available funding, some medium or low priority activities may be implemented before some high priority items.
- ✓ **Document mitigation planning process** - The mitigation planning process is documented throughout this plan.

Hazard Land Use Policy in California

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

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

Planning for hazards requires a thorough understanding of the various hazards facing the City and region as a whole. Additionally, it's important to take an inventory of the structures and contents of various City holdings. These inventories should include the compendium of hazards facing the City, the built environment at risk, the personal property that may be damaged by hazard events and most of all, the people who live in the shadow of these hazards. Such an analysis is found in this hazard mitigation plan.

State and Federal Partners in Hazard Mitigation

All mitigation is local and the primary responsibility for development and implementation of risk reduction strategies and policies lies with each local jurisdiction. Local jurisdictions, however, are not alone. Partners and resources exist at the regional, state and federal levels. Numerous California state agencies have a role in hazards and hazard mitigation.

Some of the key agencies include:

- ✓ California Office of Emergency Services (Cal OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- ✓ Southern California Earthquake Center (SCEC) gathers information about earthquakes, integrates information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives.

- ✓ California Department of Forestry and Fire Protection (CAL FIRE) is responsible for all aspects of wildland fire protection on private and state properties, and administers forest practices regulations, including landslide mitigation, on non-federal lands.
- ✓ California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, and the development of partnerships aimed at reducing risk.
- ✓ California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public, serves local water needs by providing technical assistance
- ✓ FEMA provides hazard mitigation guidance, resource materials, and educational materials to support implementation of the capitalized DMA 2000.
- ✓ United States Census Bureau (USCB) provides demographic data on the populations affected by natural disasters.
- ✓ United States Department of Agriculture (USDA) provides data on matters pertaining to land management.

Stakeholders

A Hazard Mitigation Planning Team (Planning Team) consisting of department representatives from City of Santa Fe Springs staff worked with Emergency Planning Consultants to create the Plan. **The Planning Team served as the primary stakeholders throughout the planning process.** Upon completion, the Planning Team reviewed and commented on the First Draft Plan.

As required by DMA 2000, the Planning Team involved “the public” in a variety of forums. External agencies (including special districts and adjoining jurisdictions) were emailed an invitation to review the Second Draft Plan. The Second Draft Plan was also announced on the City’s website on October 2, 2017 to inform the general public of the Plan’s availability during the plan writing phase.

The Planning Team, general public, and external agencies all served as stakeholders with opportunity to contribute to the plan during the Plan Writing Phase of the planning process.

Hazard Mitigation Legislation

Hazard Mitigation Grant Program

In 1974, Congress enacted the Robert T. Stafford Disaster Relief and Emergency Act, commonly referred to as the Stafford Act. In 1988, Congress established the Hazard Mitigation Grant Program (HMGP) via Section 404 of the Stafford Act. Regulations regarding HMGP implementation based on the DMA 2000 were initially changed by an Interim Final Rule (44 CFR Part 206, Subpart N) published in the Federal Register on February 26, 2002. A second Interim Final Rule was issued on October 1, 2002.

The HMGP helps states and local governments implement long-term hazard mitigation measures for natural hazards by providing federal funding following a federal disaster declaration. Eligible applicants include state and local agencies, Indian tribes or other tribal organizations, and certain nonprofit organizations.

In California, the HMGP is administered by Cal OES. Examples of typical HMGP projects include:

- ✓ Property acquisition and relocation projects
- ✓ Structural retrofitting to minimize damages from earthquake, flood, high wind, wildfire, or other natural hazards
- ✓ Elevation of flood-prone structures
- ✓ Vegetative management programs, such as:
 - Brush control and maintenance
 - Fuel break lines in shrubbery
 - Fire-resistant vegetation in potential wildland fire areas

Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation Program (PDM) was authorized by §203 of the Stafford Act, 42 United States Code, as amended by §102 of the DMA 2000. Funding is provided through the National Pre-Disaster Mitigation Fund to help state and local governments (including tribal governments) implement cost-effective hazard mitigation activities that complement a comprehensive mitigation program.

In Fiscal Year 2009, two types of grants (planning and competitive) were offered under the PDM Program. Planning grants allocate funds to each state for Mitigation Plan development. Competitive grants distribute funds to states, local governments, and federally recognized Indian tribal governments via a competitive application process. FEMA reviews and ranks the submittals based on pre-determined criteria. The minimum eligibility requirements for competitive grants include participation in good standing in the National Flood Insurance Program (NFIP) and a FEMA-approved Mitigation Plan. (Source: <http://www.fema.gov/fima/pdm.shtm>)

“Floods and hurricanes happen. The hazard itself is not the disaster – it’s our habits, it’s how we build and live in those areas...that’s the disaster.”

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) Program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101). Financial support is provided through the National Flood Insurance Fund to help states and communities implement measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.

***Craig Fugate, Former
FEMA Administrator***

Three types of grants are available under FMA: planning, project, and technical assistance. Planning grants are available to states and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for project grants to implement measures to reduce flood losses. Technical assistance grants in the amount of 10 percent of the project grant are available to the state for program administration. Communities that receive planning and/or project grants must participate in the NFIP. Examples of eligible projects include elevation, acquisition, and relocation of NFIP-insured structures. (Source: <http://www.fema.gov/fima/fma.shtm>)

Q&A | ELEMENT C. MITIGATION STRATEGY | C2

Q: Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))

A: See **NFIP Participation** below.

National Flood Insurance Program

Established in 1968, the NFIP provides federally-backed flood insurance to homeowners, renters, and businesses in communities that adopt and enforce floodplain management ordinances to reduce future flood damage.

NFIP Participation

The FEMA FIRM map panels for the City of Santa Fe Springs were last updated September 26, 2008. According to the Federal Emergency Management Agency, the majority of the City is designated as Zone "X" by the National Flood Insurance Program. Zone X is an area determined to be outside the 500-year flood zone and protected by levee from 100-year flood. The City of Santa Fe Springs contains the following flood zones: Zone X, AH, AE.

The City will maintain its participation with NFIP by continuing to enforce the Zoning Ordinance. Enforcement takes place when a prospective developer submits a permit request or building plans and the Planning and Development Department staff member looks up the zoning on the property. If the property is located in or near a designated floodplain, the applicant is provided with an NFIP brochure.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B4

Q: Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))

A: See **Repetitive Loss Properties** below.

Repetitive Loss Properties

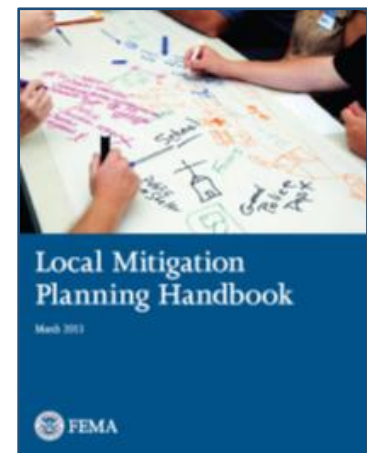
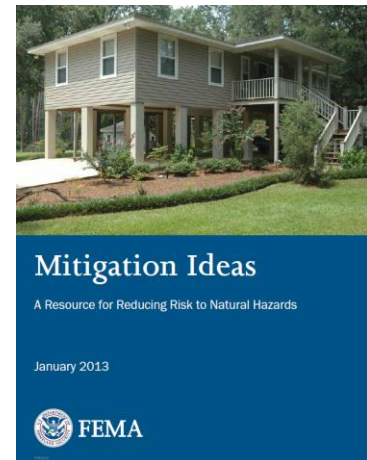
Repetitive Loss Properties (RLPs) are most susceptible to flood damages; therefore, they have been the focus of flood hazard mitigation programs. Unlike a Countywide program, the Floodplain Management Plan (FMP) for repetitive loss properties involves highly diversified property profiles, drainage issues, and property owner's interest. It also requires public involvement processes unique to each RLP area. The objective of an FMP is to provide specific potential mitigation measures and activities to best address the problems and needs of communities with repetitive loss properties. A repetitive loss property is one for which two or more claims of \$1,000 or more have been paid by the National Flood Insurance Program (NFIP) within any given ten-year period. According to FEMA resources, there are no Repetitive Loss Properties (RLPs) within the City of Santa Fe Springs.

State and Federal Guidance in Hazard Mitigation

While local jurisdictions have primary responsibility for developing and implementing hazard mitigation strategies, they are not alone. Various state and federal partners and resources can help local agencies with mitigation planning.

The Mitigation Plan was prepared in accordance with the following regulations and guidance documents:

- ✓ DMA 2000 (Public Law 106-390, October 10, 2000)
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, October 1, 2002
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, February 26, 2002
- ✓ How-To Guide for Using HAZUS-MH for Risk Assessment, (FEMA 433), February 2004
- ✓ Mitigation Planning “How-to” Series (FEMA 386-1 through 9 available at: <http://www.fema.gov/fima/planhowto.shtm>)
- ✓ Getting Started: Building Support for Mitigation Planning (FEMA 386-1)
- ✓ Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA 386-2)
- ✓ Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3)
- ✓ Bringing the Plan to Life: Implementing the Mitigation Plan (FEMA 386-4)
- ✓ Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)
- ✓ Integrating Historic Property and Cultural Resource Considerations into Mitigation Planning (FEMA 386-6)
- ✓ Integrating Manmade Hazards into Mitigation Planning (FEMA 386-7)
- ✓ Multi-Jurisdictional Mitigation Planning (FEMA 386-8)
- ✓ Using the Mitigation Plan to Prepare Successful Mitigation Projects (FEMA 386-9)
- ✓ State and Local Plan Interim Criteria Under the DMA 2000, July 11, 2002, FEMA
- ✓ Mitigation Planning Workshop for Local Governments-Instructor Guide, July 2002, FEMA
- ✓ Report on Costs and Benefits of Natural Hazard Mitigation, Document #294, FEMA
- ✓ LHMP Development Guide – Appendix A - Resource, Document, and Tool List for Local Mitigation Planning, December 2, 2003, Cal OES
- ✓ Local Mitigation Plan Review Guide (FEMA 2011)
- ✓ Local Mitigation Planning Handbook (FEMA 2013)



How is the Plan Organized?

The structure of the plan enables the reader to use a section of interest to them and allows the City to review and update sections when new data is available. The ease of incorporating new data into the plan will result in a Mitigation Plan that remains current and relevant. Following is a description of each section of the plan:

I: Planning Process

Introduction

Describes the background and purpose of developing a mitigation plan.

Planning Process

Describes the mitigation planning process including: stakeholders and integration of existing data and plans.

Part II: Risk Assessment

Community Profile

Summarizes the history, geography, demographics, and socioeconomics of the City.

Risk Assessment

This section provides information on hazard identification, vulnerability and risk associated with hazards in the City.

City-Specific Hazard Analysis

Describes the hazards posing a significant threat to the City including:

Earthquake | Flooding | Dam Failure | Urban Fire | Hazardous Materials

Each City-Specific Hazard Analysis includes information on previous occurrences, local conditions, hazard assessment, and local impacts.

Part III: Mitigation Strategies

Mitigation Strategies

Documents the goals, community capabilities, and priority setting methods supporting the Plan. Also highlights the Mitigation Actions Matrix: 1) goals met; 2) identification, assignment, timing, and funding of mitigation activities; 3) benefit/cost/priorities; 4) plan implementation method; and 5) activity status.

Plan Maintenance

Establishes tools and guidelines for maintaining and implementing the Mitigation Plan.

Part IV: Appendix

The plan appendices are designed to provide users of the Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and potential resources to assist them with implementation.

General Hazard Overviews

Generalized subject matter information discussing the science and background associated with the identified hazards.

Attachments

- FEMA Letter of Approval
- City Council Staff Report
- City Council Resolution
- Planning Team sign-in sheets
- General public web postings and notices
- References
- Listing of Maps, Tables, and Figures

Plan Adoption and Approval

As per DMA 2000 and supporting Federal regulations, the Mitigation Plan is required to be adopted by the City Council and approved by FEMA. See the **Planning Process Section** for details.

Who Does the Mitigation Plan Affect?

This plan provides a framework for planning for natural and human-caused hazards. The resources and background information in the plan are applicable City-wide and to City-owned facilities outside of the City boundaries, and the goals and recommendations provide groundwork for local mitigation plans and partnerships. **Map: City of Santa Fe Springs** shows the regional proximity of the City to its adjoining communities.

Planning Process

As mentioned above, the planning process began back in 2009 including Planning Team meetings, development of a Plan and adoption by City Council. However, the Plan was set aside due to budget and staffing limitation and was resurrected with a new planning process beginning in 2017. The majority of the discussion that follows refers to the efforts begun in 2017 however documentation of the earlier plan writing efforts is also included.

Throughout the project, the City followed its traditional approach to developing policy documents which included preparation of a First Draft Plan for review by the Planning Team who served as the primary stakeholders. Next, following necessary updates, a Second Draft Plan was shared with the general public and external agencies (special districts and adjoining jurisdictions) still during the plan writing phase. The general public and external agencies served as the secondary stakeholders. Next, the comments gathered from the secondary stakeholders were incorporated into a Third Draft Plan which was submitted to Cal OES and FEMA for review and “Approval Pending Adoption”.

Next, the Planning Team completed amendments to the Plan to reflect mandated input by Cal OES and FEMA. The Final Draft Plan was posted according to noticing protocols in the City. Any comments gathered during the posting period were included in the staff report to City Council. Following adoption by the City Council, proof of adoption was forwarded to FEMA along with a request for final approval. The planning process described above is portrayed below in a timeline:

Q&A | ELEMENT A: PLANNING PROCESS | A1a.

Q: Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)? (Requirement §201.6(c)(1))

A: See **Plan Methodology** and **Planning Phases Timeline** below.

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

A: See **Planning Phases Timeline** below.

Figure: Planning Phases Timeline

PLANNING PHASES TIMELINE				
Plan Writing Phase (First & Second Draft Plan)	Plan Review Phase (Third & Fourth Draft Plan)	Plan Adoption Phase (Final Draft Plan)	Plan Approval Phase (Final Plan)	Plan Implementation Phase
- Planning Team input – research, meetings, writing, review of First Draft Plan - Incorporate input from the Planning Team into Second Draft Plan - Invite public and external agencies to review, comment, and contribute to the Second Draft Plan. - Incorporate input into the Third Draft Plan	- Third Draft Plan sent to Cal OES and FEMA for Approval Pending Adoption - Address any mandated revisions identified by Cal OES and FEMA into Final Draft Plan	- Incorporate input into the City Council staff report. - Post public notice of City Council meeting - Final Draft Plan distributed to City Council in advance of meeting - Present Final Draft Plan to the City Council for Adoption	- Submit proof of Council adoption to FEMA along with request for final approval - Incorporate FEMA approval into the Final Plan	- Conduct quarterly Planning Team meetings - Integrate mitigation action items into budget, CIP and other funding and strategic documents - Implement Mitigation Action Items



Plan Methodology

The Planning Team discussed knowledge of natural hazards and past historical events, as well as planning and zoning codes, ordinances, and recent planning decisions.

The rest of this section describes the mitigation planning process including 1) Planning Team involvement, 2) extended Planning Team support (department heads), 3) public and external agency involvement; and 4) integration of existing data and plans.

Planning Team Involvement

The Planning Team consisted of representatives from City of Santa Fe Springs departments related to hazard mitigation processes. The Planning Team served as the primary stakeholders throughout the planning process. The general public (e.g. citizens, businesses, etc.) along with external agencies served as secondary stakeholders in the planning process. The Planning Team was responsible for the following tasks:

- ✓ Confirming planning goals
- ✓ Prepare timeline for plan update
- ✓ Ensure plan meets DMA 2000 requirements
- ✓ Organize and solicit involvement of public and external agencies
- ✓ Analyze existing data and reports
- ✓ Update hazard information
- ✓ Review HAZUS loss projection estimates
- ✓ Create Mitigation Action Items
- ✓ Participate in Planning Team meetings and City Council public meeting
- ✓ Provide existing resources including maps and data

As mentioned earlier, the planning effort began back in 2009. Since that time, the makeup of the Planning Team has changed considerably. The current Planning Team is listed in the **Credits**.

Following is a brief description of each of the Planning Team meetings dating back to the early efforts on the project:

Meeting #1: Pre-Training April 5, 2004 – Mitigation Training

The meeting was hosted by the City of Santa Fe Springs. EPC delivered training to the Planning Team and Working Groups. The training consisted of the history of the Disaster Mitigation Act of 2000, the purpose and role of hazard mitigation, and the planning process. The training lasted approximately 2 hours.

Meeting #2: Kick-Off Meeting April 5, 2004 – Kick-Off and Hazard Overview

EPC facilitated a workshop where participants had an opportunity to learn about various natural hazards, assess and rank the local threats, examine hazard maps, and complete the FEMA Worksheets contained in FEMA 386-2 Understanding Your Risks. Part of the discussion included a presentation by EPC of historical disaster events across the country. Those slides served as a backdrop for discussing potential mitigation activities.

There was an extensive discussion on various methods of engaging the public in the mitigation process. The Planning Team prepared a draft media release and discussed a public opinion survey provided by EPC. EPC committed to revising the media release and survey and distributing electronic copies to each of the Planning Team entities. The Kick-Off Meeting lasted approximately 7 hours.

Meeting #3 Pre-Training: Mitigation June 8, 2004 – Hazard Mitigation Concepts

The meeting was hosted by the City of Whittier and held at the East Whittier City School District Offices. EPC delivered a training to the Planning Team. The training consisted of the concepts and issues related to developing mitigation actions. The training lasted approximately 1 hour.

Meeting #4 Mitigation Actions June 8, 2004 – Mitigation Strategies

EPC delivered the Draft Hazard Analysis and the Planning Team discussed missing information, data, and maps. EPC distributed copies of the Mitigation Actions Planning Tools to assist the Team in developing Goals and Action Items appropriate to their natural hazards. The Planning Tools provided a process for collecting the mitigation actions presently in practice in the City of Santa Fe Springs, as well as identifying future mitigation actions.

A brainstorming process was then conducted to develop the goals for the Plan. The entire Multi-Jurisdictional Planning Team quickly agreed to adopt the same mitigation goals. Following a discussion of alternative ranking techniques, the Team agreed to cluster the rankings of the hazards in the following order: #1 Multi-Hazard, #2 Earthquakes, and #3 Flooding.

Meeting #5: June 1, 2017 – Kick-Off Meeting – Research Collection

The Kick-Off meeting with the Planning Team was made up of key departmental representatives. The purpose of the Kick-Off Meeting was to review project expectations and timeline, gather pertinent documents, role and membership of Planning Team, review updates to DMA 2000 regulations, discuss availability of mapping resources, and discuss opportunities for public involvement. The meeting included a review of the hazards and impacts since the writing of the original draft Mitigation Plan. Additionally, the status of Mitigation Actions identified in the draft plan were reviewed. The review included gathering information as to status, assignment and scheduling.

Meeting #5: July 6, 2017 – Mitigation Strategies

Before beginning the discussion on mitigation strategies, EPC presented the results of the HAZUS work and distributed a copy of one of the HAZUS reports. Next, EPC delivered an overview of FEMA mitigation categories and encouraged the Planning Team to capture all the ongoing and planned activities relating to mitigation. The Planning Team began the process by updating the Mitigation Actions Matrix from the 2009 Draft Plan for inclusion in the 2017 First Draft Plan. Next, the CIP was reviewed for projects relating to mitigation and the Team. EPC encouraged Team members to use the time before the final meeting to think of new mitigation actions to be included in the First Draft Plan.

Meeting #6: August 3, 2017 – Finalizing the First Draft Plan

In advance of the meeting, EPC sent the First Draft Plan to the Planning Team Chair for distribution to the Team. EPC asked the Team for any questions, corrections, or comments in need of attention. Next, the Team was asked for any new mitigation action items as well as a discussion on the steps to be followed in distributing the Second Draft Plan to the general public and external agencies.

Q&A | ELEMENT A: PLANNING PROCESS | A1a.

Q: Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)? (Requirement §201.6(c)(1))

A: See **Table: Planning Level of Participation** and **Table: Planning Team Timeline** below.

Table: Planning Team Level of Participation

Name	Research and Writing of Plan	Planning Team Meeting 6/1/17	Planning Team Meeting 7/6/2017	Planning Team Meeting 8/3/2017	Planning Team Comment on First Draft Plan	Review and input from public, and external agencies of the Second Draft Plan	Third Draft Plan to Cal OES/FEMA for Approval Pending Adoption	Post Final Draft Plan for review by public and external agencies	Present Final Draft Plan to City Council at Public Meeting for Plan Adoption	Submit Proof of Adoption to FEMA	Incorporate FEMA Approval into Final Plan
City of Santa Fe Springs											
Darryl Pedigo		X			X	X	X				
Cuong Nguyen		X			X						
Heriberto Valdes		X			X						
Heleo Espinoza		X			X						
Raul Diaz		X			X						
Brenda ten Bruggencate			X								
Sarina Morales-Choate		X			X						
Emergency Planning Consultants											
Carolyn J. Harshman	X	X	X	X							

Table: Planning Team Timeline

	May 2017	June	July	August	September	October	November	December	January 2018	February	March	April	May
Research and Writing of First Draft Plan	X	X											
Planning Team Meetings		X	X	X									
Planning Team Review and Comment on First Draft Plan				X									
Review and comment by public and external agencies of the Second Draft Plan				X									
Third Draft Plan to Cal OES/FEMA for Approval Pending Adoption					X	X	X	X	X	X	X	X	
Receive FEMA Approval Pending Adoption													X
Post Final Draft Plan for review by public and external agencies along with posting of City Council meeting.													
Present Final Draft Plan to City Council at Public Meeting													
Submit Proof of Adoption to FEMA													
Incorporate FEMA Approval into Final Plan													

Q&A | ELEMENT A: PLANNING PROCESS | A2a.

Q: Does the plan document an opportunity for neighboring communities, local, and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, as well as other interested parties to be involved in the planning process? (Requirement §201.6(b)(2))

A: See **Secondary Stakeholder Involvement** below.

Q&A | ELEMENT A: PLANNING PROCESS | A2b.

Q: Does the plan document an opportunity for neighboring communities, local, and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, as well as other interested parties to be involved in the planning process? (Requirement §201.6(b)(2))

A: See **Secondary Stakeholder Involvement** below.

Secondary Stakeholder Involvement

In addition to the Planning Team, the secondary stakeholders also provided information, expertise, and other resources during plan writing phase. The secondary stakeholders included: general public and external agencies (special districts, and adjoining jurisdictions). All gathered input was directed to the Chair of the Planning Team who incorporated the information into the Third Draft Plan. Following is a specific accounting of the date, source, and information gathered:

Figure: Invited Individuals and Comments

General Public or External Agency	Name & Job Title	Comments
General Public was invited via news release and City's website to participate during the plan writing phase. Following are comments received from the General Public:		
No general public comments received.	N/A	No comments received.
External Agencies were invited via email to participate during the plan writing phase. Following are comments received from the External Agencies:		
City of Whittier	Rod Hill, Director, EOC Operations	No comments received.
City of Downey	Mark Gillaspie, Fire Chief	No comments received.
City of Pico Rivera	John Gonzales	No comments received.
City of Cerritos	Emely Merina, Community Services Supervisor	No comments received.
Whittier High School District	Fernie Fernandez, Assistant Principal of Business & Activities	No comments received.

External agencies listed above were invited via email and provided with an electronic link to the City's website. Following is the email distributed along with the invitation to comments:

Figure: External Agencies Email Invite

Hello,

The City of Santa Fe Springs is in the process of preparing its 2017 Hazard Mitigation Plan (Plan). As you know, mitigation plans are regulated by the federal government through the Disaster Mitigation Act of 2000. The Plan is required to identify the natural hazards, however the City has opted to also include urban fires and human-caused and technological hazards in order to be better aware and prepared for a broader range of hazards. The Plan provides a list of mitigation action items that will be used to reduce the impacts from the identified hazards.

Part of the mandated approval process for the Plan requires the authoring jurisdiction to share the draft plan with key stakeholders and solicit comments during the “plan writing phase”. Should you have interest (and time), feel free to review the Draft Plan and share any comments with me by October 17, 2017. If you are not able to provide comments by that date, I will move forward with the understanding that you do not have any concerns and are comfortable with the Second Draft Plan as it is written.

Thank you in advance for your time and assistance with this project. I look forward to reading any comments that may come my way.

Darryl Pedigo, Public Safety Officer
City of Santa Fe Springs
DarrylPedigo@santafesprings.org
(562) 409-1850

The general public was invited via news release and the City’s website as to the availability of the Second Draft Plan. Any comments received are noted above in **Table: Invited Individuals and their Comments**. Gathered comments from the general public and external agencies were incorporated into the Third Draft Plan prior to sending to Cal OES and FEMA for review and approval.

Q&A | ELEMENT C. MITIGATION STRATEGY | C1a.

Q: Does the plan document each jurisdiction’s existing authorities, policies, programs and resources? (Requirement §201.6(c)(3))

A: See **Capability Assessment – Existing Processes and Programs** below.

Capability Assessment – Existing Processes and Programs

The City will incorporate mitigation planning as an integral component of daily operations. This will be accomplished by the Planning Team working with their respective departments to integrate mitigation strategies into the planning documents and operational guidelines within the City. In addition to the Capability Assessment below, the Planning Team will strive to identify additional policies, programs, practices, and procedures that could be created or modified to address mitigation activities.

Table: Capability Assessment - Existing Processes and Programs

Process	Action	Implementation of Plan
Hazard Mitigation	Ensure representation on Planning Team includes all departments responsible for the existing processes and programs identified in this table.	✓ <i>Planning Team's effectiveness in implementing Plan and creating a culture of mitigation</i> ✓ <i>Planning Team members become "ambassadors" in the various departments charged with influencing development, infrastructure, and future planning</i> ✓ <i>Involve Hazard Mitigation Planning Team in review of future updates of the City's General Plan (overall assessment of demographic, land use, and economic conditions and future goals) or Zoning Ordinance (specific development standards pertaining to specific lots within the City including lot size and use, setbacks, etc.) to ensure consideration of threats posed by hazards (See Mitigation Actions Matrix – "Planning Mechanisms")</i>
Administrative	Departmental or organizational work plans, policies, and procedural changes	✓ <i>City Manager's Office</i> ✓ <i>Planning and Development Department</i> ✓ <i>Public Works Department</i> ✓ <i>Other departments as appropriate</i> ✓ <i>Continue training staff for all aspects of Emergency Management and ensure adequate staffing levels by cross-training staff for each identified capability/task</i>
Administrative	Other plans	✓ <i>Reference plan in Emergency Operations Plan (identifies authorities and references for the City to take action before, during, and after a disaster including identification of roles and responsibilities of departments within the City)</i> ✓ <i>Address plan findings and incorporate mitigation activities in General Plan</i>
Budgetary	Capital and operational budgets	✓ <i>Include line item mitigation measures in budget as appropriate</i>
Regulatory	Executive orders, ordinances, and other directives	✓ <i>Building Code (describes specific technical standards about the way a structure is built and maintained including building, electrical, and plumbing materials),</i> ✓ <i>Capital Improvement Program (includes projects for City-owned developments that require multiple years of budgetary commitments.) (Require hazard mitigation in design of new construction)</i> ✓ <i>General Plan (Institutionalize hazard mitigation in land use and new construction)</i> ✓ <i>National Flood Insurance Program</i> ✓ <i>Storm Water Management Plan</i> ✓ <i>Zoning Ordinance</i>
Funding	Traditional and nontraditional sources	✓ <i>Once plan is approved, seek authority to use bonds, fees, loans, and taxes to finance projects</i> ✓ <i>Seek assistance from federal and state government, foundation, nonprofit, and private sources, such as Hazard Mitigation Grant Program</i>

Process	Action	Implementation of Plan
		✓ <i>Research and grant opportunities through U.S. Department of Housing and Urban Development, Community Development Block Grant</i>
Partnerships	Creative funding and initiatives	✓ <i>Community volunteers</i> ✓ <i>In-kind resources</i> ✓ <i>Public-private partnerships</i> ✓ <i>State support</i>
Partnerships	Advisory bodies and committees	✓ <i>Disaster Council</i> ✓ <i>Disaster Management Area Coordinator</i> ✓ <i>Safety Committee</i>

Q&A | ELEMENT A: PLANNING PROCESS | A4

Q: Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))

A: See **Use of Existing Data** below.

Use of Existing Data

The Planning Team gathered and reviewed existing data and plans during plan writing and specifically noted as “sources”. Numerous electronic and hard copy documents were used to support the planning process:

City of Santa Fe Springs General Plan and Elements

www.santafesprings.org

Applicable Incorporation: Land Use map, Community Profile section – geography, environmental, population, housing, transportation and demographic data, Safety Element - Hazard information

County of Los Angeles All-Hazards Mitigation Plan (2014)

www.lacounty.gov

Applicable Incorporation: Information about hazards in the County contributed to the hazard-specific sections in the City’s Mitigation Plan.

California State Hazard Mitigation Plan (2013)

<http://www.caloes.ca.gov/>

Applicable Incorporation: Used to identify hazards posing greatest hazard to State.

HAZUS maps and reports

Created by Emergency Planning Consultants

Applicable Incorporation: Numerous HAZUS results have been included for earthquake and flood scenarios to determine specific risk to City of Santa Fe Springs.

California Department of Finance

www.dof.ca.gov/

Applicable Incorporation: Community Profile section – demographic and population data

FEMA “How To” Mitigation Series (386-1 to 386-9)

www.fema.gov/media

Applicable Incorporation: Mitigation Measures Categories and 4-Step Planning Process are quoted in the Executive Summary.

National Flood Insurance Program

www.fema.gov/national-flood-insurance-program

Applicable Incorporation: Used to confirm there are no repetitive loss properties within the City

Local Flood Insurance Rate Maps

www.msc.fema.gov

Applicable Incorporation: Provided by FEMA and included in Flood Hazard section.

California Department of Conservation

www.conservation.ca.gov/cgs

Applicable Incorporation: Seismic hazards mapping

U.S. Geological Survey (USGS)

www.usgs.gov

Applicable Incorporation: Earthquake records and statistics

Q&A | ELEMENT E: PLAN ADOPTION | E1

Q: Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))

A: See **Plan Adoption Process** below.

Plan Adoption Process

Adoption of the plan by the local governing body demonstrates the City's commitment to meeting mitigation goals and objectives. Governing body approval legitimizes the plan and authorizes responsible agencies to execute their responsibilities.

The City Council must adopt the Mitigation Plan before the Plan can receive final approval from FEMA.

In preparation for the public meeting with the City Council, the Planning Team prepared a Staff Report including an overview of the Planning Process, Risk Assessment, Mitigation Goals, and Mitigation Actions. The staff presentation concluded with a summary of the input received during the public review of the document. The meeting participants were encouraged to present their views and make suggestions on possible mitigation actions.

The City Council heard the item on [REDACTED]. The City Council voted [REDACTED] to adopt the updated Mitigation Plan. The Resolution of adoption by the City Council is in the **Appendix**.

Plan Approval

FEMA issued an Approval Pending Adoption on May 10, 2018. Upon receipt of the City Council's adoption, FEMA issued a Letter of Approval on [REDACTED]. A copy of the FEMA Letter of Approval is in the **Appendix**.

Part II: RISK ASSESSMENT

Community Profile

Geography and History

According to the Santa Fe Springs General Plan - Housing Element (2014), the City of Santa Fe Springs is located approximately 13 miles southeast of downtown Los Angeles and 18 miles north of the City of Long Beach. Neighboring cities include Whittier, La Mirada, Cerritos, Norwalk, Downey, and Pico Rivera. Santa Fe Springs' regional location and proximity to major transportation corridors have been important factors contributing to the City's development as a predominately industrial community.



Santa Fe Springs incorporated in 1957, with the majority of its residential growth occurring during the 1950s. Less than ten percent of the City's nine square miles is designated for residential use, with residential neighborhoods historically concentrated in the western portion of the City away from industrial uses, although small pockets of housing also exist along the City's eastern boundary adjoining residential areas in adjacent communities. The City contains approximately 5,100 housing units, with single-family homes comprising two thirds of all housing, and a homeownership rate of 60 percent.

The City was the location of one of the world's largest oil field explorations in the 1920's. The impacts of the period still affect the City's planning and risk assessment process.

Climate

According to the National Weather Service, the City has a moderate climate, including dry summers with an average temperature of about 74°F and cool, wet winters with an average temperature of 55°F. The average annual rainfall for the region is between 14-18 inches.

As the State of California and the Los Angeles region has undergone a recent several-year drought, rainfall has been much lower in the City. However, rainfall totals have been on the rise since the start of 2017 due to El Niño weather conditions.

Furthermore, actual rainfall in the Southern California region tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. In short rainfall in Southern California might be characterized as feast or famine within a single year.

Population and Demographics

According to the City's General Plan – Housing Element (2014), during the 1990s, the City evidenced a 12 percent increase in population, well above that of most surrounding communities, as well as the seven percent increase Countywide. In contrast, the City's population actually declined by seven percent during the most recent decade (2000-2010).

According to the California Department of Finance (2015), the demographic makeup of the City is as follows:

Table: City of Santa Fe Springs Demographics
(Source: California Department of Finance, E-5, 2015)

Racial/Ethnic Group	2010	2015	Change	Change %
Hispanic	13,137	13,534	397	3%
White	1,927	1,903	(24)	-1%
Asian or Pacific Islander	644	1,090	446	69%
African American	305	424	119	39%
American Indian	65	66	1	2%
Other Race	145	145	0	0%
TOTAL	16,223	17,162	939	6%

Housing and Community Development

Table: City of Santa Fe Springs Housing
(Source: California Department of Finance, E-5, 2015)

2015	Number	Percent %
Housing Type:		
1-unit, detached	3,314	63.9 %
1-unit, attached	220	4.2 %
2-4 Units	171	3.3 %
5+ Units	1,349	26.0 %
Mobile homes/Other	132	2.5 %
Housing Statistics:		
Total Occupied Housing Units	4,931	100 %
Owner-Occupied Housing	2,959	60.0 %
Renter-Occupied	1,972	40.0 %
Average Household Size:	3.4 persons	
Median Home Price:	\$351,200	

Employment and Industry

According to the City's General Plan – Housing Element (2014), the most dominant employment sectors were Education/Health/Social Services and Manufacturing, accounting for approximately 40 percent of resident employment. Approximately one-quarter of residents were employed in typically lower paying industries – retail, accommodations/food services, construction, and services.

Santa Fe Springs offers a strong industrial employment base, with approximately 50,000 jobs. This job base allows a large number of residents to work in their community. The SCAG 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy projects a limited two percent increase, or 900 additional jobs, in Santa Fe Springs during the 2008-2035 period.

Table: City of Santa Fe Springs Industry
(Source: American Community Survey - 2015)

Industry	2015	
	Number	Percent %
Agriculture, forestry, fishing and hunting, and mining	56	0.8 %
Construction	421	5.9 %
Manufacturing	943	13.2 %
Wholesale Trade	374	5.2 %
Retail Trade	712	10.0 %
Transportation and Warehousing, and Utilities	452	6.3 %
Information	72	1.0 %
Finance and insurance, and real estate and rental and leasing	513	7.2 %
Professional, scientific, and management, and administrative and waste management services	582	8.2 %
Educational services, and health care and social assistance	1,806	25.3 %
Arts, entertainment, and recreation, and accommodation and food services	463	6.5 %
Other services, except public administration	346	4.9 %
Public administration	385	5.4 %

Table: City of Santa Fe Springs Occupation
(Source: American Community Survey - 2015)

Occupation	2015	
	Number	Percent
Civilian employed population (16 years and over)	7,125	100.0 %
Management, business, science, and arts occupations	2,185	30.7 %
Service occupations	1,110	15.6 %
Sales and office occupations	2,134	30.0 %
Natural resources, construction, and maintenance occupations	604	8.5 %
Production, transportation, and material moving	1,092	15.3 %

Transportation and Commuting Patterns

According to the City of Santa Fe Springs's General Plan – Circulation Element (1994), the City lies at the convergence of two major transportation routes, Interstates 5 and 605, and is within one mile of the easterly terminus of Interstate Route 105. It is traversed by major Southern Pacific and Santa Fe rail corridors, including both cargo and passenger transportation, and is under the flight landing pattern for Los Angeles International Airport.

Metrolink

Santa Fe Springs is served by Metrolink rail from the Norwalk/Santa Fe Springs station located at 12700 Imperial highway. On weekdays, this station is served by 19 Orange County Line trains and nine 91 Line trains. Metrolink is the nation's 3rd largest commuter rail system by route miles.

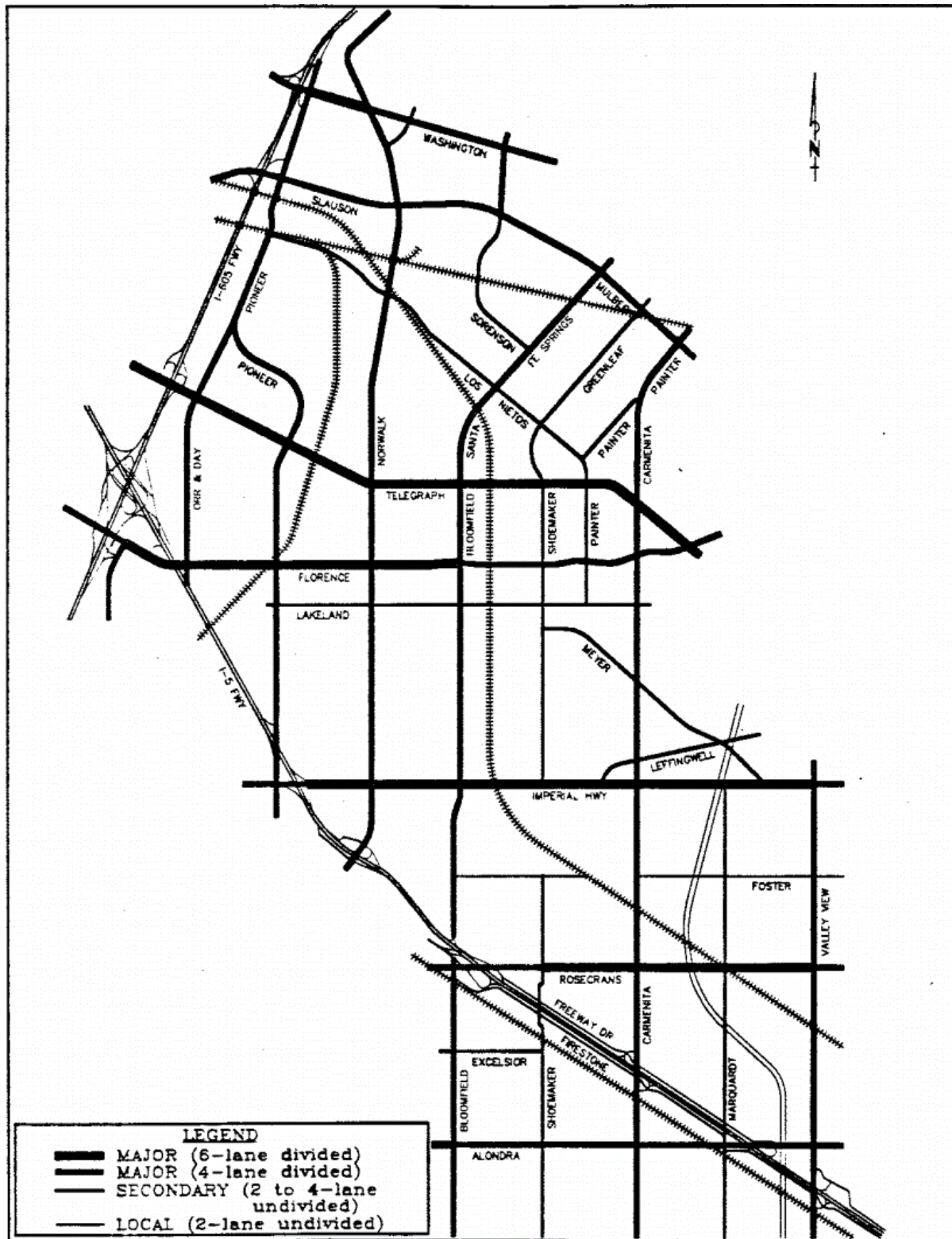
Air Travel

Air travel for City residents is available from several airports in the region. John Wayne Airport in Orange County is approximately 25 miles to the south. The major airport serving the entire region is Los Angeles International (LAX), located 20 miles west of the City.



Map: Major Roadways

(Source: City of Santa Fe Springs General Plan – Circulation Element 1994)



Risk Assessment

What is a Risk Assessment?

Conducting a risk assessment can provide information regarding: the location of hazards; the value of existing land and property in hazard locations; and an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the five levels of a risk assessment are as follows:

1. *Hazard Identification*
2. *Profiling Hazard Events*
3. *Vulnerability Assessment/Inventory of Existing Assets*
4. *Risk Analysis*
5. *Assessing Vulnerability/Analyzing Development Trends*

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Hazard Identification** below.

1) Hazard Identification

This section is the description of the geographic extent, potential intensity, and the probability of occurrence of a given hazard. Maps are used in this plan to display hazard identification data. ***The City of Santa Fe Springs utilized the categorization of hazards as identified in California's 2013 State Hazard Mitigation Plan, including: Earthquakes, Floods, Levee Failures, Wildfires, Landslides and Earth Movements, Tsunami, Climate-related Hazards (including Drought), Volcanoes, and Other Hazards. The City also considered the hazards identified in the County of Los Angeles All-Hazard Mitigation Plan which addressed Earthquakes, Floods, Wildfires, Tsunami, and Non-Significant Hazards (including Drought).***



Next, the Planning Team reviewed their General Plan to determine which of the hazards posed the most significant threat to the City and whether there were any additional hazards they'd like to include. The Team concluded the greatest threats were posed by Earthquake, Flooding, Dam Failure, Urban Fire, and Hazardous Materials.

The geographic extent of each of the identified hazards was identified by the Planning Team utilizing maps and data contained in the City's General Plan Elements. In addition, numerous internet resources and the County of Los Angeles All-Hazards Mitigation Plan served as valuable resources. Utilizing the Calculated Priority Risk Index (CPRI) ranking technique, the Planning Team concluded the following hazards posed a significant threat against the City:

Earthquake | Flooding | Dam Failure | Urban Fire | Hazardous Materials

The hazard ranking system is described in **Table: Calculated Priority Risk Index**, while the actual ranking is shown in **Table: Calculated Priority Risk Index Ranking for City of Santa Fe Springs**.

Table: Calculated Priority Risk Index
(Source: Federal Emergency Management Agency)

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of occurrences or events. Annual probability of less than 1 in 1,000 years.	1	45%
	Possibly	Rare occurrences. Annual probability of between 1 in 100 years and 1 in 1,000 years.	2	
	Likely	Occasional occurrences with at least 2 or more documented historic events. Annual probability of between 1 in 10 years and 1 in 100 years.	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability of greater than 1 every year.	4	
Magnitude/Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure. Injuries or illnesses are treatable with first aid and there are no deaths. Negligible loss of quality of life. Shut down of critical public facilities for less than 24 hours.	1	30%
	Limited	Slight property damage (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability, and there are no deaths. Moderate loss of quality of life. Shut down of critical public facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damage (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least 1 death. Shut down of critical public facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	Severe property damage (greater than 50% of critical and non-critical facilities and infrastructure). Injuries and illnesses result in permanent disability and multiple deaths. Shut down of critical public facilities for more than 1 month.	4	
Warning Time	> 24 hours	Population will receive greater than 24 hours of warning.	1	15%
	12–24 hours	Population will receive between 12-24 hours of warning.	2	
	6-12 hours	Population will receive between 6-12 hours of warning.	3	
	< 6 hours	Population will receive less than 6 hours of warning.	4	
Duration	< 6 hours	Disaster event will last less than 6 hours	1	10%
	< 24 hours	Disaster event will last less than 6-24 hours	2	
	< 1 week	Disaster event will last between 24 hours and 1 week.	3	
	> 1 week	Disaster event will last more than 1 week	4	

Table: Calculated Priority Risk Index Ranking for City of Santa Fe Springs

Hazard	Probability	Weighted 45% (x.45)	Magnitude Severity	Weighted 30% (x.3)	Warning Time	Weighted 15% (x.15)	Duration	Weighted 10% (x.1)	CPRI Total
Earthquake – Puente Hills M7.1	3	1.35	4	1.2	4	0.6	1	0.1	3.25
Earthquake – Newport-Inglewood M7.1	3	1.35	3	0.9	4	0.6	1	0.1	2.95
Earthquake – San Andreas M8.0	2	.90	3	0.9	4	0.6	1	0.1	2.50
Earthquake – Whittier-Elsinore M7.0	2	.90	3	0.9	4	0.6	1	0.1	2.50
Flooding	3	1.35	1	0.3	1	0.15	2	0.2	2.00
Dam Failure	2	.90	3	0.9	3	0.45	1	0.1	2.35
Urban Fire	1	.45	1	0.3	4	0.6	2	0.2	1.55
Hazardous Materials	2	.90	2	0.6	4	0.6	2	0.2	2.30

2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard and what part of the City's facilities, infrastructure, and environment may be vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in the City-Specific Hazard Analysis. **Table: Vulnerability: Location, Extent, and Probability for City of Santa Fe Springs** indicates a generalized perspective of the community's vulnerability of the various hazards according to extent (or degree), location, and probability.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1b.

Q: Does the plan provide rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Santa Fe Springs** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1c.

Q: Does the plan include a description of the **location** for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Santa Fe Springs** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1d.

Q: Does the plan include a description of the **extent** for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Santa Fe Springs** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Santa Fe Springs** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2b.

Q: Does the plan include information on the **probability** of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Santa Fe Springs** below.

Table: Vulnerability: Location, Extent, and Probability for City of Santa Fe Springs

Hazard	Location (Where)	Extent (How Big an Event)	Probability (How Often) *	Previous Occurrences
Earthquake	Entire Project Area	The Southern California Earthquake Center (SCEC) in 2007 concluded that there is a 99.7 % probability that an earthquake of M6.7 or greater will hit California within 30 years. ¹	Moderate	1987 – Whittier Narrows
Flooding	Isolated Portions of the Project Area	Urban Flooding resulting from Severe Weather – extent varies on weather.	Moderate	January – February 2017 – Localized Urban Flooding
Dam Failure	Northwestern portion of the City to the west of Norwalk Boulevard	In the unlikely event of a Whittier Narrows dam failure, floodwaters would extend to the northwest corner of Santa Fe Springs within one and one hour.	Low	None
Urban Fire	Entire Project Area	Major property fire damage and significant impact to City residents.	High	March 13, 2017 – Los Nietos Recycling
Hazardous Materials	Entire Project Area	Extent varies greatly depending on the scope, scale, and magnitude of Hazmat incident	Moderate	August 2015 – Air Gas
* Probability is defined as: Low = 1:1,000 years, Moderate = 1:100 years, High = 1:10 years				
¹ Uniform California Earthquake Rupture Forecast				

3) Vulnerability Assessment/Inventory of Existing Assets

A Vulnerability Assessment in its simplest form is a simultaneous look at the geographical location of hazards and an inventory of the underlying land uses (populations, structures, etc.). Facilities that provide critical and essential services following a major emergency are of particular concern because these locations house staff and equipment necessary to provide important public safety, emergency response, and/or disaster recovery functions.

Critical Facilities

FEMA separates critical buildings and facilities into the five categories shown below based on their loss potential. All of the following elements are considered critical facilities:

Essential Facilities are essential to the health and welfare of the whole population and are especially important following hazard events. Essential facilities include hospitals and other medical facilities, police and fire stations, emergency operations centers and evacuation shelters, and schools.

Transportation Systems include airways – airports, heliports; highways – bridges, tunnels, roadbeds, overpasses, transfer centers; railways – trackage, tunnels, bridges, rail yards, depots; and waterways – canals, locks, seaports, ferries, harbors, drydocks, piers.

Lifeline Utility Systems such as potable water, wastewater, oil, natural gas, electric power and communication systems.

High Potential Loss Facilities are facilities that would have a high loss associated with them, such as nuclear power plants, dams, and military installations.

Hazardous Material Facilities include facilities housing industrial/hazardous materials, such as corrosives, explosives, flammable materials, radioactive materials, and toxins.

Table: Critical & Essential Facilities Vulnerable to Hazards illustrates the hazards with potential to impact critical facilities owned by or providing services to the City of Santa Fe Springs.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Table: Critical & Essential Facilities Vulnerable to Hazards** below.

Table: Critical & Essential Facilities Vulnerable to Hazards

Name of Facility	Earthquake	Flooding	Dam Failure	Urban Fire	Hazardous Materials
CRITICAL & ESSENTIAL FACILITIES:					
City Hall 11710 Telegraph Road	X		X	X	
Fire Station #1 11300 Greenstone Avenue	X		X	X	X
Fire Station #2 8634 Dice Road	X			X	X
Fire Station #3 15517 Carmenita Road	X			X	X
Fire Station #4 11736 Telegraph Road	X		X	X	X
Police Services Center 11576 Telegraph Road	X		X	X	X
HAZARDOUS MATERIALS FACILITIES:					
Air Liquide 8832 Dice Road	X			X	X
Baker Petrolite 11808 Bloomfield Avenue	X			X	X
B.J. Services 11927 Greenstone Avenue	X			X	X
Brenntag Pacific 10747 Patterson Pl	X			X	X
Brown-Pacific 13639 Bora Drive	X			X	X
Bumble Bee Foods 13100 Arctic Circle	X			X	X
Custom Chemical 8707 Millergrove Drive	X		X	X	X
Del Monte Fresh Produce 10730 Patterson Place	X			X	X
Hereus Metal Processing Inc 13429 Alondra Boulevard	X			X	X
JBS 13215 Cambridge Street	X			X	X

Name of Facility	Earthquake	Flooding	Dam Failure	Urban Fire	Hazardous Materials
KIK So Cal 9028 Dice Road	X			X	X
Korean Farms 12500 Slauson Avenue	X			X	X
Northstar Chemical 9051 Sorensen Avenue	X			X	X
Olin Chlor Alkali 11600 Pike Street	X		X	X	X
Phibro-Tech 8851 Dice Road	X			X	X
Polycoat Products 14722 Spring Avenue	X			X	X
Sika Corporation 12767 Imperial Highway	X			X	X
Trojan Battery 12380 Clark Street	X			X	X
Trojan Battery 9440 Ann Street	X			X	X
Univar 12522 Los Nietos Road	X			X	X
Univar 13900 Carmenita Road	X			X	X
UTC 11120 Norwalk Boulevard	X			X	X
Vons Warehouse 12801 Excelsior Drive	X			X	X
Weber Distribution 13350 Rosecrans Avenue	X			X	X

4) Risk Analysis

Estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. For each hazard where data was available, quantitative estimates for potential losses have been included in the hazard assessment. Data was not available to make vulnerability determinations in terms of dollar losses for all of the identified hazards. The **Mitigation Actions Matrix** includes an action item to conduct such an assessment in the future.

5) Assessing Vulnerability/ Analyzing Development Trends

This step provides a general description of City facilities and contents in relation to the identified hazards so that mitigation options can be considered in land use planning and future land use decisions. This Mitigation Plan provides comprehensive description of the character of the City of Santa Fe Springs in the **Community Profile Section**. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of the City of Santa Fe Springs can help in identifying potential problem areas and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

Hazard assessments are subject to the availability of hazard-specific data. Gathering data for a hazard assessment requires a commitment of resources on the part of participating organizations and agencies. Each hazard-specific section of the plan includes a section on hazard identification using data and information from City, County, state, or federal sources.

Regardless of the data available for hazard assessments, there are numerous strategies the City can take to reduce risk. These strategies are described in the action items detailed in the Mitigation Actions Matrix in the **Mitigation Strategies Section**. Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure.

Land and Development

The City of Santa Fe Springs General Plan provides the framework for the growth and development of the City. This Plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces.

According to the City's General Plan - Land Use Element (1994), most of its residential growth occurred during the 1950s. Approximately ten percent of the City is zoned for residential uses, and the majority of these areas are now fully developed. The changes in the demographic characteristics have resulted in a demand for more housing.

Due to the City's predominant industrial environment (approximately 75% of present land use), a major focus will be a continued effort to provide for the conservation and rehabilitation of the City's

single-family housing stock, in addition to providing for better utilization of land where existing oil fields now exist.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impacts to Types of Land Uses** below.

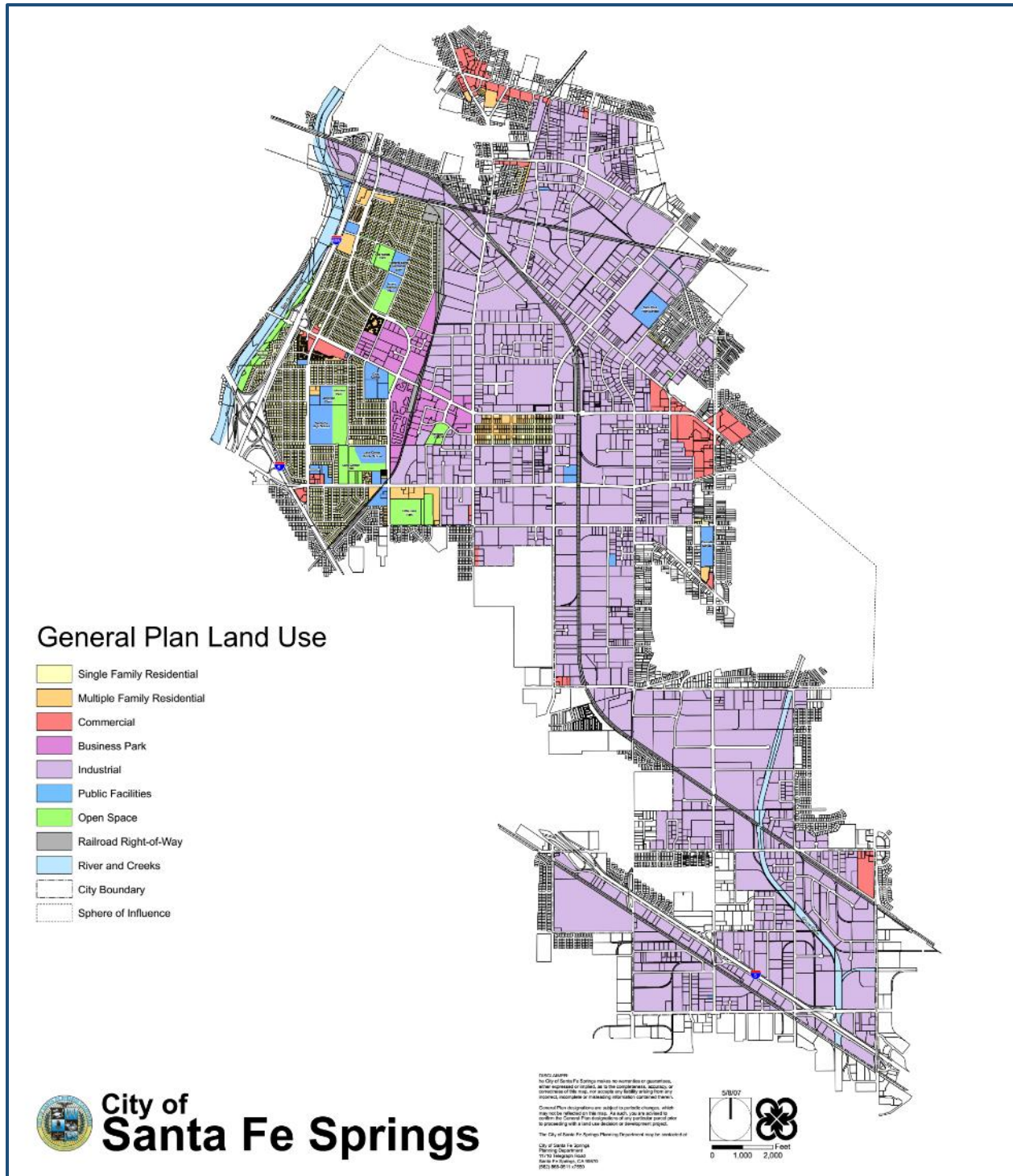
Impacts to Types of Land Uses

City of Santa Fe Springs's General Plan identifies a split between residential and non-residential land uses. In general terms, the non-residential land uses are categorized as commercial, industrial, business park, industrial, public facilities, and open space.

Table: Impacts to Existing and Future Land Uses in the City of Santa Fe Springs
(Source: EPC Analysis Based on City of Santa Fe Springs General Plan – Land Use Element)

Category of Land Use Designation	Acres (Area)	Acres (%)	Earthquake	Flooding	Dam Failure	Urban Fire	Hazardous Materials
Residential	474	10%	X	X	X	X	X
Commercial	317	7%	X	X	X	X	X
Business Park	104	2%	X	X	X	X	X
Industrial	3,396	75%	X		X	X	X
Public Facilities	142	3%	X		X	X	X
Open Space	125	3%	X	X	X	X	X

Map: Land Use Map
(Source: City of Santa Fe Springs General Plan – Land Use Element, 1994)



Earthquake Hazards

Previous Occurrences of Earthquakes in the City of Santa Fe Springs

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Earthquakes in the City of Santa Fe Springs** below.

Recent earthquakes impacting Santa Fe Springs include the Northridge Earthquake of 1994 (Magnitude 6.7), Whittier Earthquake of 1987 (Magnitude 5.9); and Landers Earthquake of 1992 (Magnitude 7.3).

In January 1994, the magnitude 6.7 Northridge Earthquake (thrust fault) which produced severe ground motion, caused 57 deaths, 9,253 injuries and left over 20,000 displaced. Scientists have stated that such devastating shaking should be considered the norm near any large thrust earthquake. Recent reports from scientists of the U.S. Geological Survey and the Southern California Earthquake Center say that the Los Angeles Area could expect one earthquake every year of magnitude 5.0 or more for the foreseeable future.



Although there have been smaller incidents, Santa Fe Springs has never been severely impacted by an earthquake.

Previous Occurrences of Earthquakes in Los Angeles County

Southern California has a history of powerful and relatively frequent earthquakes, dating back to the powerful magnitude 8.0+ 1857 San Andreas Earthquake which did substantial damage to the relatively few buildings that existed at the time.

Paleoseismological research indicates that large magnitude (8.0+) earthquakes occur on the San Andreas Fault at intervals between 45 and 332 years with an average interval of 140 years. Other lesser faults have also caused very damaging earthquakes since 1857. Notable earthquakes include the 1933 Long Beach Earthquake, the 1971 San Fernando Earthquake, the 1987 Whittier Earthquake and the 1994 Northridge Earthquake.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

According to the City of Santa Fe Springs General Plan - Safety Element (1994), the City lies within a metropolitan area that has historically been seismically active. Faults are prevalent throughout California and are commonly classified as either "active" or "potentially active." An active fault is a break that has moved in recent geologic time (the last 11,000 years) and that is likely to move within the next approximately 100 years. Active faults are the primary focus of concern in attempting to prevent earthquake hazards. A potentially active fault is one that has shifted but not in the recent geologic period (or, between 11,000 and 3,000,000 years ago) and is therefore considered dormant or unlikely to move in the future.

Several active faults have been identified within close proximity or within the City boundaries which, most importantly, indicates that the community falls under the State Earthquake Fault Zoning Act and the State Hazards Mapping Act. These Acts require that local governments, in the general plan update process, adopt policies and criteria to ensure the structural adequacy of buildings erected across active faults for human occupancy. In some cases, the development of structures must be prohibited.

Earthquakes that could affect the City would most likely originate from the **San Andreas, Whittier-Elsinore, Newport-Inglewood, Sierra Madre, or Puente Hills Faults**. These faults are close enough in proximity or expected to generate strong enough shaking that could significantly impact the City.

San Andreas Fault

The San Andreas Fault Zone is located approximately 37 miles east of the City of Santa Fe Springs. This fault zone extends from the Gulf of California northward to the Cape Mendocino area where it continues northward along the ocean floor. The total length of the San Andreas Fault Zone is approximately 750 miles. The activity of the fault has been recorded during historic events, including the 1906 (M8.0) event in San Francisco and the 1857 (M7.9) event between Cholame and San Bernardino, where at least 250 miles of surface rupture occurred. These seismic events are among the most significant earthquakes in California history. Geologic evidence suggests that the San Andreas Fault has a 50 percent chance of producing a magnitude 7.5 to 8.5 quake (comparable to the great San Francisco earthquake of 1906) within the next 30 years.

Whittier-Elsinore Fault

The Whittier-Elsinore Fault is approximately two miles north of the City. This northwest trending fault continues eastward from the Alhambra area through the Santa Ana Mountains to the Mexican border. The fault has historically experienced moderate activity, having produced numerous magnitude 4 earthquakes and a few at magnitude 5. The largest historical earthquake

on this fault occurred in 1976 and had a magnitude of 4.2. The maximum credible earthquake for this fault is estimated to be of magnitude 7.0.

Newport-Inglewood Fault

The Newport-Inglewood Fault is approximately 9 miles southwest of the City of Santa Fe Springs. The fault consists of an echelon series of northwest trending faults reaching from the southern edge of the Santa Monica Mountains south-eastward to the offshore area near Newport Beach. High historic seismic activity is suggested by numerous shocks greater than magnitude 4 and by the historic magnitude 6.3 Long Beach earthquake centered off-shore near Newport Beach in 1933. Although there has been no observed displacement associated with the Newport-Inglewood Fault, there has been subsurface fault displacement of approximately seven inches associated with the 1941 earthquake of magnitude 4.5. This fault is capable of generating a 7.0 magnitude earthquake within the next 50-100 years.

Sierra Madre Fault

Located approximately 25 miles north of Santa Fe Springs, the Sierra Madre fault system forms a prominent 50-mile long east-west structural zone on the south side of the San Gabriel Mountains. This fault system has been responsible for uplift of the San Gabriel Mountains by reverse faulting in response to south-north tectonic compression. The Sierra Madre fault system has been divided into the Cucamonga, Duarte, Dunsmore, San Fernando and Sierra Madre segments. A 5.8 earthquake occurred on the fault in 1991, 7 miles north of the City of Monrovia. It is estimated that a magnitude 7.0 earthquake is credible on this fault system.

Puente Hills Fault

Discovered in 2003, the Puente Hills fault system is comprised of three sections that run under downtown Los Angeles and into the Coyote Hills of north Orange County. The Santa Fe Springs Segment of this fault runs directly through the middle of the City. According to estimates by the USGS and Southern California Earthquake Center, a massive quake on the Puente Hills fault could kill from 3,000 to 18,000 people and cause up to \$250 billion in damage.

Map: Regional Faults plots the various major faults located closest to the City of Santa Fe Springs.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Earthquakes in the City of Santa Fe Springs** below.

Impact of Earthquakes in the City of Santa Fe Springs

Based on the risk assessment, it is evident that earthquakes will continue to have potentially devastating economic impacts to certain areas of the City. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life;
- ✓ Commercial and residential structural damage;
- ✓ Disruption of and damage to public infrastructure;
- ✓ Secondary health hazards e.g. mold and mildew;
- ✓ Damage to roads/bridges resulting in loss of mobility;
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community;
- ✓ Negative impact on commercial and residential property values; and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Earthquake-Induced Landslides

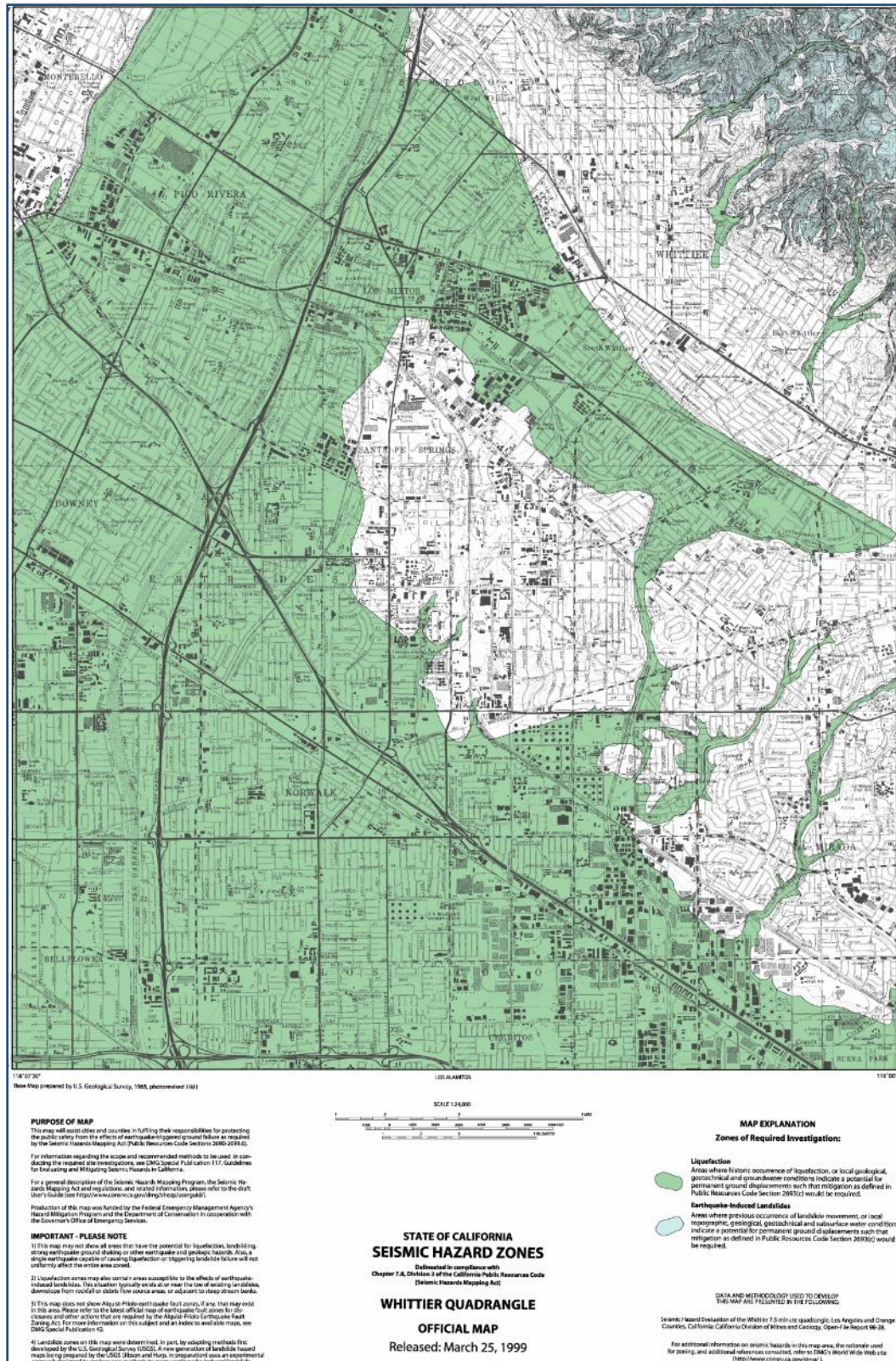
Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes.

Map: Landslide and Liquefaction Zones shows the no immediate risk of earthquake-induced landslide risk within the City.

Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other events. Liquefaction occurs in saturated soils, which are soils in which the space between individual soil particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. Because liquefaction only occurs in saturated soil, its effects are most commonly observed in low lying areas. Typically, liquefaction is associated with shallow groundwater, which is less than 50 feet beneath the earth's surface. According to the City of Santa Fe Springs General Plan - Safety Element (1994), liquefaction within the City is generally not a hazard as the water table is generally deeper than 50 feet. Areas immediately adjacent to the San Gabriel River may have moderate liquefaction risk as shown in **Map: Landslide and Liquefaction Zones**.

Map: Landslide and Liquefaction Zones in Santa Fe Springs (Source: California Department of Conservation)



Exposure

The data in this section was generated using the HAZUS-MH program for earthquakes. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the amount of damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up.

Building Inventory

HAZUS estimates approximately 73% of the building stock within the City of Santa Fe Springs is residential housing consisting of wood frame construction.

Critical Facility Inventory

HAZUS breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

Table: Critical Facility Inventory – HAZUS

Essential Facilities	Count
Hospitals	1
Schools	11
Fire Stations	4
Police Stations	1
Emergency Operations Facilities	0

High Potential Loss (HPL) Facilities	Count
Dams	0
Levees	0
Military Installations	0
Nuclear Power Plants	0
Hazardous Material Sites	24

Transportation and Utility Lifeline Inventory

Within HAZUS, the lifeline inventory is divided between transportation and utility lifeline systems. Transportation systems include highways, railways, light rail, bus, ports, ferry and airports. Utility systems include potable water, wastewater, natural gas, crude & refined oil, electric power and communications.

Casualties

HAZUS estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows:

- ✓ **Severity Level 1:** Injuries will require medical attention but hospitalization is not needed.
- ✓ **Severity Level 2:** Injuries will require hospitalization but are not considered life-threatening
- ✓ **Severity Level 3:** Injuries will require hospitalization and can become life threatening if not promptly treated.
- ✓ **Severity Level 4:** Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Building-Related Losses

Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

HAZUS Earthquake Event Summary Results

Newport-Inglewood M7.1 Earthquake Scenario

Building Damage

Table: Expected Building Damage Newport-Inglewood M7.1

Damage Extent	None	Slight	Moderate	Extensive	Complete
Total	5,197	1,692	506	68	7

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Newport-Inglewood M7.1

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	1,135	53	13
Waste Water	681	38	10
Natural Gas	454	11	3
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – Newport-Inglewood M7.1

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	7,163	0	0	0	0	0
Electric Power		0	0	0	0	0

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 21 households to be displaced due to the earthquake. Of these, 22 people (out of a total population of 17,162) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for Newport-Inglewood M7.1 earthquake scenario.

Table: Casualty Estimates – Newport-Inglewood M7.1

Time	Level 1	Level 2	Level 3	Level 4
2 AM	8	1	0	0
2 PM	15	2	0	0
5 PM	10	2	1	0
* Level 1: Injuries will require medical attention but hospitalization is not needed. Level 2: Will require hospitalization but are not considered life-threatening. Level 3: Will require hospitalization and can become life threatening if not promptly treated. Level 4: Victims are killed by earthquake.				

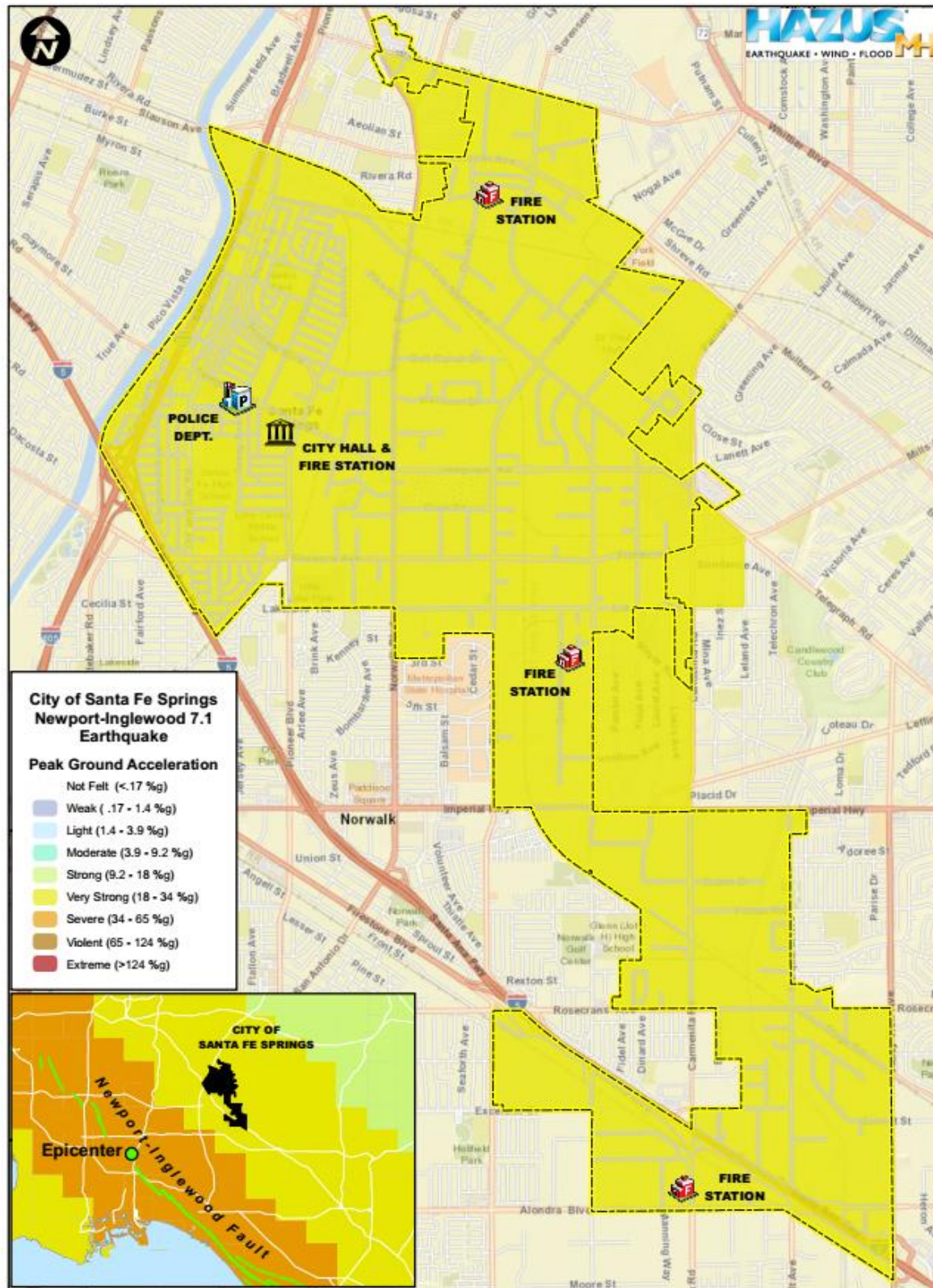
Economic Losses

The total economic loss estimated for the Newport-Inglewood M7.1 earthquake scenario is **\$288.97 million dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Economic Losses (\$ Dollars) – Newport-Inglewood M7.1

Category	Estimated Loss (\$)
Income	\$32,936,200
Capital Stock	\$237,070,400
Transportation Systems	\$3,958,800
Utility Systems	\$15,002,700
TOTAL	\$288,968,100

Map: Shake Intensity Map – Newport-Inglewood M7.1
(Source: Emergency Planning Consultants)



Puente Hills M7.1 Earthquake Scenario

Building Damage

Table: Expected Building Damage Puente Hills M7.1

Damage Extent	None	Slight	Moderate	Extensive	Complete
Total	1,556	2,764	2,218	674	258

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Puente Hills M7.1

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	1,135	439	110
Waste Water	681	314	79
Natural Gas	454	90	23
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – Puente Hills M7.1

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	7,163	2,618	586	0	0	0
Electric Power		5,616	3,753	1,715	367	7

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 326 households to be displaced due to the earthquake. Of these, 339 people (out of a total population of 17,162) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for Puente Hills M7.1 earthquake scenario.

Table: Casualty Estimates – Puente Hills M7.1

Time	Level 1	Level 2	Level 3	Level 4
2 AM	72	14	2	3
2 PM	204	56	10	18
5 PM	134	40	16	12
* Level 1: Injuries will require medical attention but hospitalization is not needed. Level 2: Will require hospitalization but are not considered life-threatening. Level 3: Will require hospitalization and can become life threatening if not promptly treated. Level 4: Victims are killed by earthquake.				

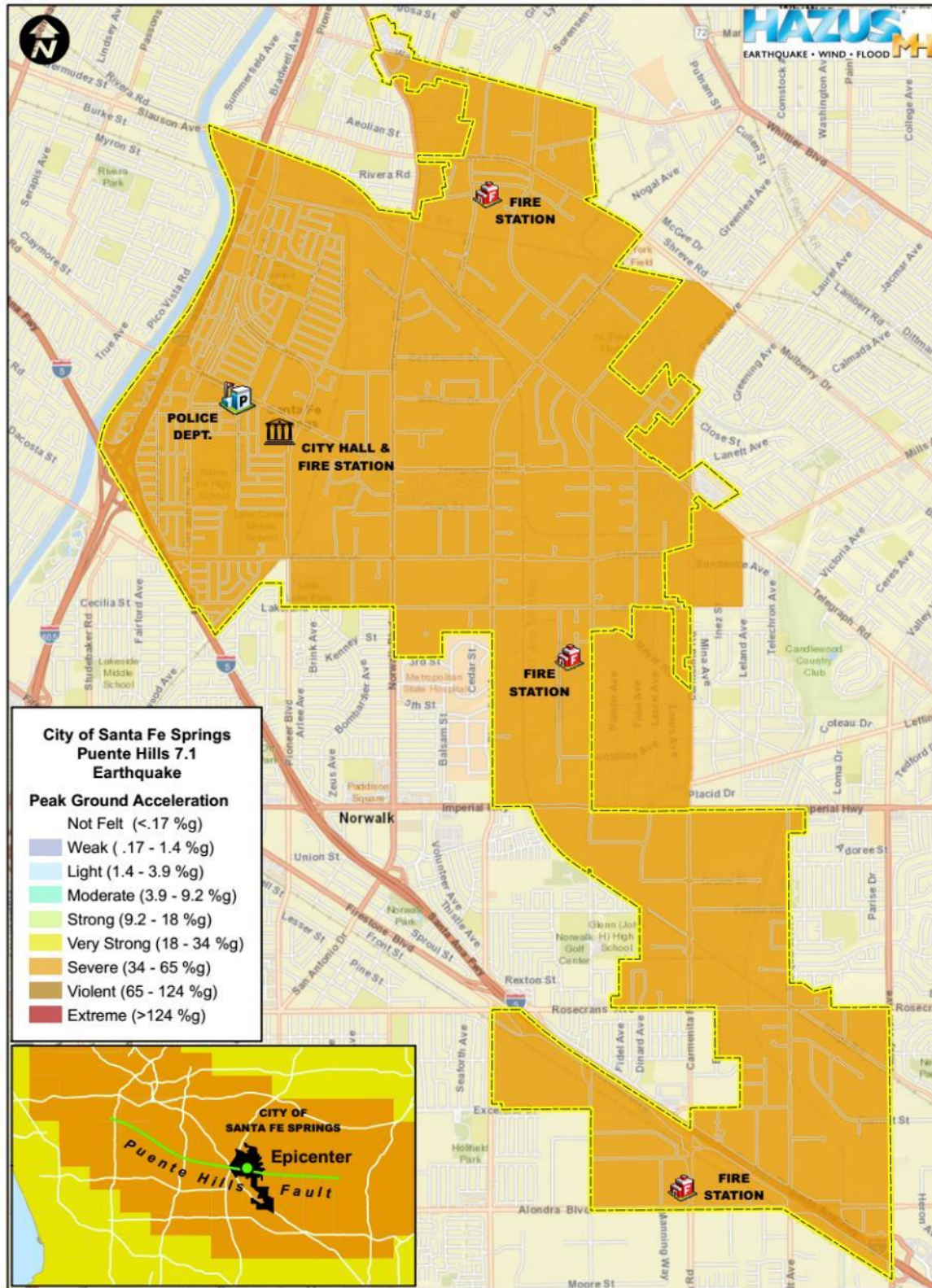
Economic Losses

The total economic loss estimated for the Puente Hills M7.1 earthquake scenario is **\$1.778 billion dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Economic Losses (\$ Dollars) – Puente Hills M7.1

Category	Estimated Loss (\$)
Income	\$209,033,900
Capital Stock	\$1,497,554,000
Transportation Systems	\$19,169,300
Utility Systems	\$52,289,300
TOTAL	\$1,778,046,500

Map: Shake Intensity Map – Puente Hills M7.1
(Source: Emergency Planning Consultants)



Structures and Building Code

The built environment is susceptible to damage from earthquakes. Buildings that collapse can trap and bury people. Lives are at risk, and the cost to clean up the damages is great. In most California communities, including the City of Santa Fe Springs, many buildings were built before 1993 when building codes were not as strict. In addition, retrofitting is not required except under certain conditions and can be expensive. Therefore, the number of buildings at risk remains high. The California Seismic Safety Commission makes annual reports on the progress of the retrofitting of unreinforced masonry buildings. According to the City of Santa Fe Springs, all URM buildings within the City have been identified and upgraded to meet current requirements.

Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Santa Fe Springs Planning Division enforces building codes pertaining to earthquake hazards.

Additionally, the City has implemented basic building requirements that are above and beyond what the State demands for hazard mitigation. Newly constructed buildings in Santa Fe Springs that are built in an area subject to earthquake-induced landslide or liquefaction are typically built with extra foundation support. Such support is found in the post-tension reinforced concrete foundation; this same technique is used by coastal cities to prevent home destruction during cases of liquefaction.

Generally, these codes seek to discourage development in areas that could be prone to flooding, landslide, wildfire and/or seismic hazards; and where development is permitted, that the applicable construction standards are met. Developers in hazard-prone areas may be required to retain a qualified professional engineer to evaluate level of risk on the site and recommend appropriate mitigation measures.

Flood Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Flooding in the City of Santa Fe Springs** below.

Previous Occurrences of Flooding in the City of Santa Fe Springs

In spite of the region’s semi-arid climate, it has experienced flood episodes throughout its history. In recent history, the City has experienced urban/localized flooding as recent as January-February 2017 but has not encountered any significant flooding events.



Previous Occurrences of Flooding in Los Angeles County

Los Angeles County records reveal since 1861, the Los Angeles River has flooded 30 times, on average once every 6.1 years. But averages are deceiving, for the Los Angeles basin goes through periods of drought and then periods of above average rainfall. Between 1889 and 1891 the river flooded every year, from 1941 to 1945, the river flooded 5 times. Conversely, from 1896 to 1914, and again from 1944 to 1969, a period of 25 years, the river did not have serious floods.

Average annual precipitation in Los Angeles County ranges from 13 inches on the coast to approximately 40 inches on the highest point of the Peninsular Mountain Range that transects the County. Several factors determine the severity of floods, including rainfall intensity and duration. A large amount of rainfall over a short time span can result in flash flood conditions. A sudden thunderstorm or heavy rain, dam failure, or sudden spills can cause flash flooding. The National Weather Service’s definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours.

The towering mountains that give the Los Angeles region its spectacular views also wring a great deal of rain out of the storm clouds that pass through. Because the mountains are so steep, the rainwater moves rapidly down the slopes and across the coastal plains on its way to the ocean.

Naturally, this rainfall moves rapidly downstream, often with severe consequences for anything in its path. In extreme cases, flood-generated debris flows will roar down a canyon at speeds near 40 miles per hour with a wall of mud, debris and water, tens of feet high. Flooding occurs when climate, geology, and hydrology combine to create conditions where water flows outside of its usual course.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

According to the City of Santa Fe Springs General Plan – Safety Element (1994), the City maintains local storm drains to minimize flooding conditions. These drains are generally designed for ten-year storms. The City has limited ability to directly control incidents of flooding. Localized flooding would most likely be from natural causes. Following is a list of storm drain locations and priority rankings (highest priority is A, medium priority is B, and lowest priority is C):

Priority (A,B,C)	Location
A-1	Carmenita south of Foster Rd. east side. No manhole
A-2	Bloomfield west side, south of entrance to Vector Control
A-3	Southwest corner of Los Nietos Rd and Santa Fe Springs Road
A-4	Southwest corner of Clarkman and Pioneer
A-5	Valley View north of Gannet on west side
A-6	12405 Telegraph Road on north side
A-7	Orr & Day median south of Whiteland on east side
A-8	13950 Rosecrans on south side
A-9	1500 Valley View northwest corner on west side
A-10	15305 Valley View north end on west side
A-12	Northwest corner of Valley View and Gannet
A-13	Telegraph east of Underpass on north side between Freeman and Greenleaf

A-14	12325 Florence Avenue
B-1	11700 Bloomfield
B-2	Northeast corner of Bloomfield and Florence
B-3	Southwest corner of Busch and Greenleaf
B-4	9415 Greenleaf
B-5	Greenleaf south of Reid
B-6	Across from 9843 Greenleaf
B-7	Northeast corner of Freeman and Telegraph
B-8	Northwest corner of Freeman and Telegraph
B-9	Freeman south of Los Nietos Road on the east side
B-10	12801 Ann Street
B-11	Los Nietos Road east of Greenleaf on south side
B-12	Southeast corner of Los Nietos Road and Painter
B-13	12950 Lakeland
B-14	North side of 13309 Rosecrans
B-15	Northwest corner of Alondra and Firestone
B-16	15050 Shoemaker (south end and east side)
B-17	15050 Shoemaker (north end and east side)
B-18	11640 Slauson south side
B-19	Northeast corner of Altamar and Dice
B-20	Northeast corner of 8602 Westman
C	10036 Harvest
C	13700 Milroy
C	13530 Rosecrans south side
C	13720 Rosecrans south side
C	13659 Rosecrans north side
C	Rosecrans and Stage Road north side
C	13840 Rosecrans south side
C	13950 Rosecrans south side
C	14050 Rosecrans south side
C	13937 Rosecrans north side
C	Firestone south side 100' west of Betty Boop
C	12909 Sandoval Street
C	Sandoval at end of cul-de-sac on south side
C	Across from 12928 Sandoval Street on north side

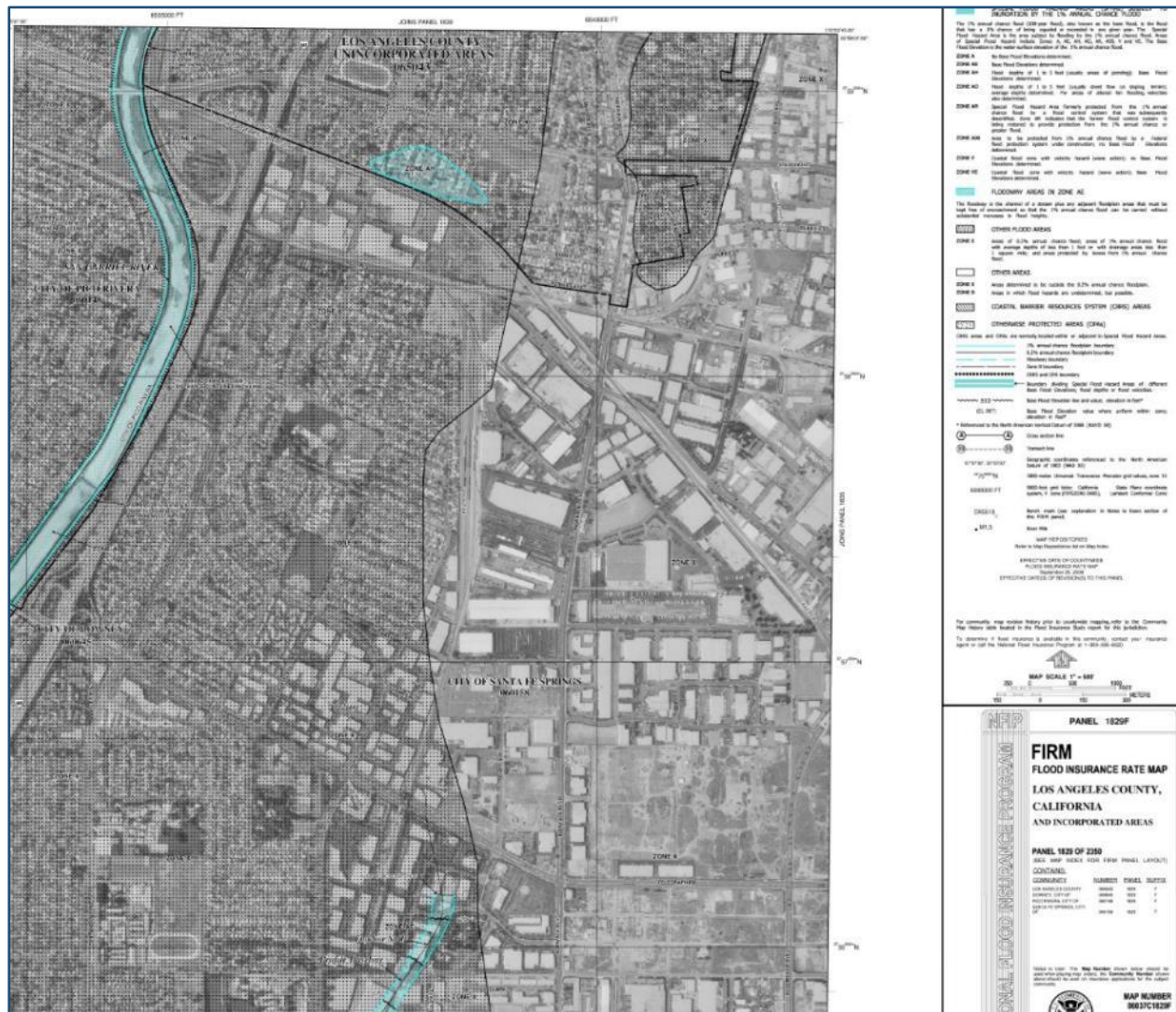
C	Bloomfield between Lakeland and Florence east side
C	Northeast corner of Bloomfield and Florence
C	Northwest corner of Bloomfield and Florence
C	10724 Bloomfield
C	Northeast corner of Emmens Way
C	Northeast corner of Clark
C	SFS Road - SFS Underpass on west side
C	Northeast corner of SFS Road and Ann Street
C	9315 SFS Road
C	Northwest corner of Busch Place

National Flood Insurance Program

The City participates in the National Flood Insurance Program (NFIP). Created by Congress in 1968, the NFIP makes flood insurance available in communities that enact minimum floodplain management rules consistent with the Code of Federal Regulations §60.3.

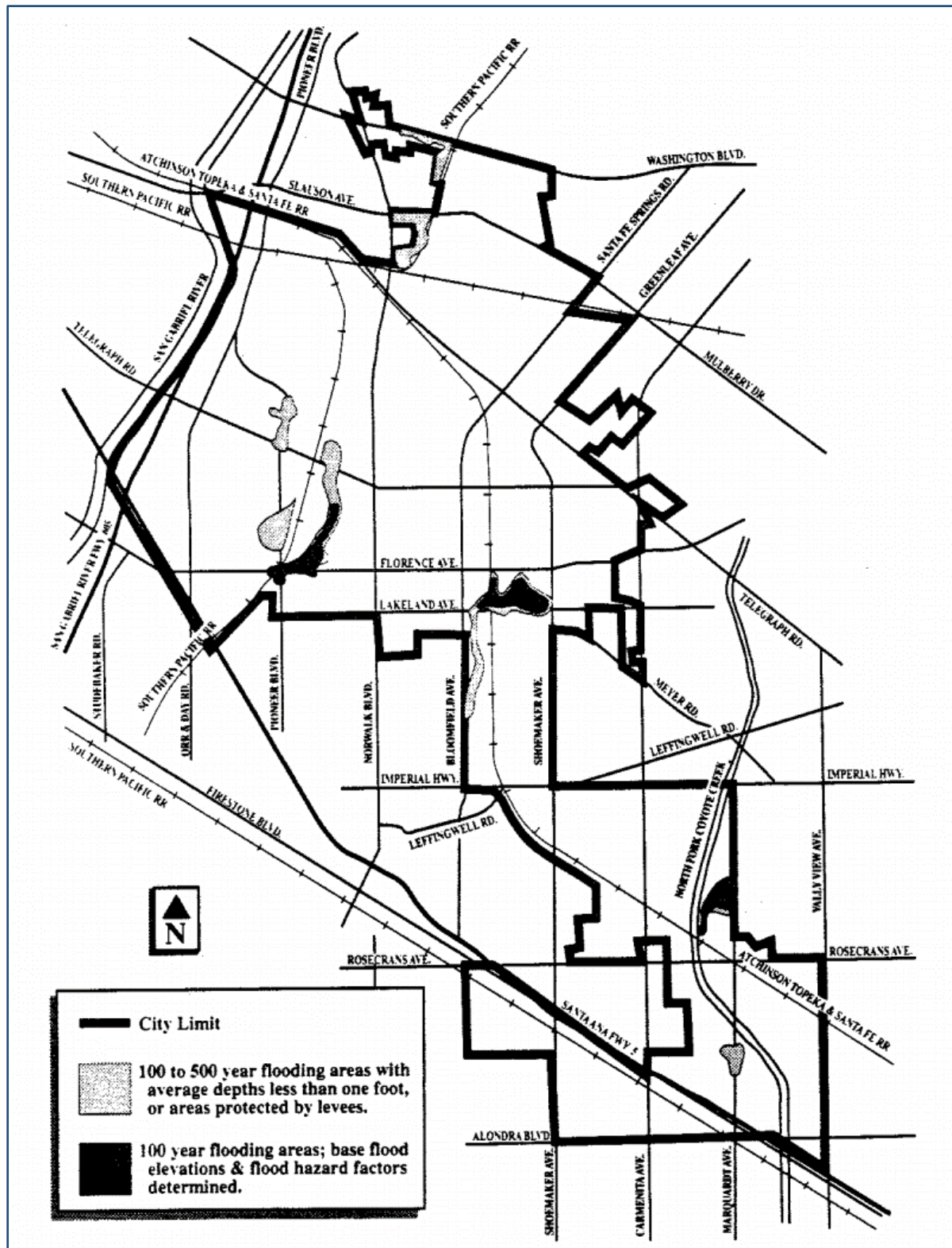
According to **Map: Flood Insurance Rate Map #1** and **#2**, the built areas of the City are in “Flood Zone X”. Zone X is defined as the area outside the 500-year flood and protected by levee from 100-year flood. Localized flooding problem areas are identified in **Map: Local Flooding Zones**.

Map: Flood Insurance Rate Map #1
(Source: FEMA Flood Map Service Center)



Map: Local Flooding Zones

(Source: City of Santa Fe Springs General Plan – Safety Element | 1994)



Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Flooding in the City of Santa Fe Springs** below.

Impact of Flooding in the City of Santa Fe Springs

Floods and their impacts vary by location and severity of any given flood event, and likely only affect certain areas of the County during specific times. Based on the risk assessment, it is evident that floods will continue to have devastating economic impact to certain areas of the City.

Impact that is not quantified, but anticipated in future events includes:

- ✓ Injury and loss of life;
- ✓ Commercial and residential structural damage;
- ✓ Disruption of and damage to public infrastructure;
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Dam Failure Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

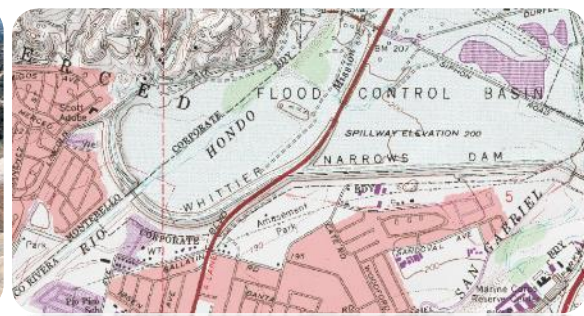
A: See **Previous Occurrences of Dam Failure in the City of Santa Fe Springs** below.

Previous Occurrences of Dam Failure in the City of Santa Fe Springs

The City of Santa Fe Springs has not been recently affected by a release/failure of any of the dam facilities identified in **Table: Dams Near City of Santa Fe Springs**.

Table: Dams Near City of Santa Fe Springs

Name of Facility	Owner	Primary Purpose
Whittier Narrows	U.S. Army Corps of Engineers (ACOE)	Flood Control



Previous Occurrences of Dam Failure in Los Angeles County

There are 103 dams in Los Angeles County, owned by 23 agencies or organizations, ranging from the Federal government to Home Owner Associations. These dams hold billions of gallons of water in reservoirs. Releases of water from the major reservoirs are designed to protect Southern California from flood waters and to store domestic water. Seismic activity can compromise the dam structures, and the resultant flooding could cause catastrophic flooding. Following the 1971 Sylmar earthquake the Lower Van Norman Dam showed signs of structural compromise, and tens of thousands of persons had to be evacuated until the dam could be drained. The dam has never been refilled.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

Loss of life and damage to structures, roads, and utilities may result from a dam failure. Economic losses also result from a lowered tax base and lack of utility profits. These effects would certainly accompany the failure of the Whittier Narrows dam located near the City of Santa Fe Springs. Because dam failure has severe consequences, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Although there may be coordination with county officials in the development of the EAP, the responsibility for developing potential flood inundation maps and facilitation of emergency response is the responsibility of the dam owner.

Whittier Narrows Dam

According to the U.S. Army Corps of Engineers, Whittier Narrows Dam is a flood risk management and water conservation project constructed in 1957 and operated by the U.S. Army Corps of Engineers, Los Angeles District. The project is located, as its name implies, at the "Whittier Narrows," a natural gap in the hills that form the southern boundary of the San Gabriel Valley. The Rio Hondo and the San Gabriel rivers flow through this gap and are impounded by the reservoir. The Whittier Narrows Dam is located 5 miles northwest of the City of Santa Fe Springs' northern boundary.

Whittier Narrows Dam, a typically dry flood risk management structure located 11 miles east of downtown Los Angeles, has been reclassified from Dam Safety Action Classification (DSAC) 2 to DSAC 1.

The DSAC 1 rating indicates that the U.S. Army Corps of Engineers considers the incremental risk – the combination of life or economic consequences with the likelihood of failure – to be very high. The reclassification as DSAC 1 identifies the dam as one of the highest priority dam safety projects in the Corps' portfolio of dams.

In a May 25, 2016, memorandum to Col. Kirk Gibbs, commander of the Corps' Los Angeles District, Mr. James Dalton, chief of Engineering and Construction at Corps headquarters, emphasized that new findings with respect to the anticipated performance of the spillway gates drove the reclassification.

The Los Angeles District is currently working with a nationwide team of experts to develop a plan to reduce the risk associated with the spillway. The Corps anticipates that some of the potential solutions will be in operation prior to the 2016-2017 winter rains; other measures will likely be installed before the end of 2017.

According to the City's General Plan – Safety Element (1994), the unlikely event of dam failure, the water flow direction would be southerly toward the cities of Pico Rivera, Whittier, Santa Fe

Springs, Downey and Norwalk. The area of inundation would be bounded by Norwalk Boulevard on the east and the Los Angeles River on the west. A water depth level of approximately 5 feet is predicted for the northern most part of Santa Fe Springs with an arrival time of one hour, gradually declining in depth to four feet at the southern end of the City 's impacted area.

Dam inundation could require the evacuation in Santa Fe Springs of 15,000 residents and approximately 300 businesses. This could require the short-term sheltering of approximately 20,000 individuals and 1,500 animals.

Map: Dam Failure Inundation – Whittier Narrows Dam (HAZUS) below shows the potential water depth inundation from a failure of the Whittier Narrows Dam.

Whittier Narrows Dam Failure Scenario

Building Damage

Table: Expected Building Damage – Whittier Narrows Dam Failure Scenario

	None	Slight	Moderate	Extensive	Complete
Total	4	318	919	10	18

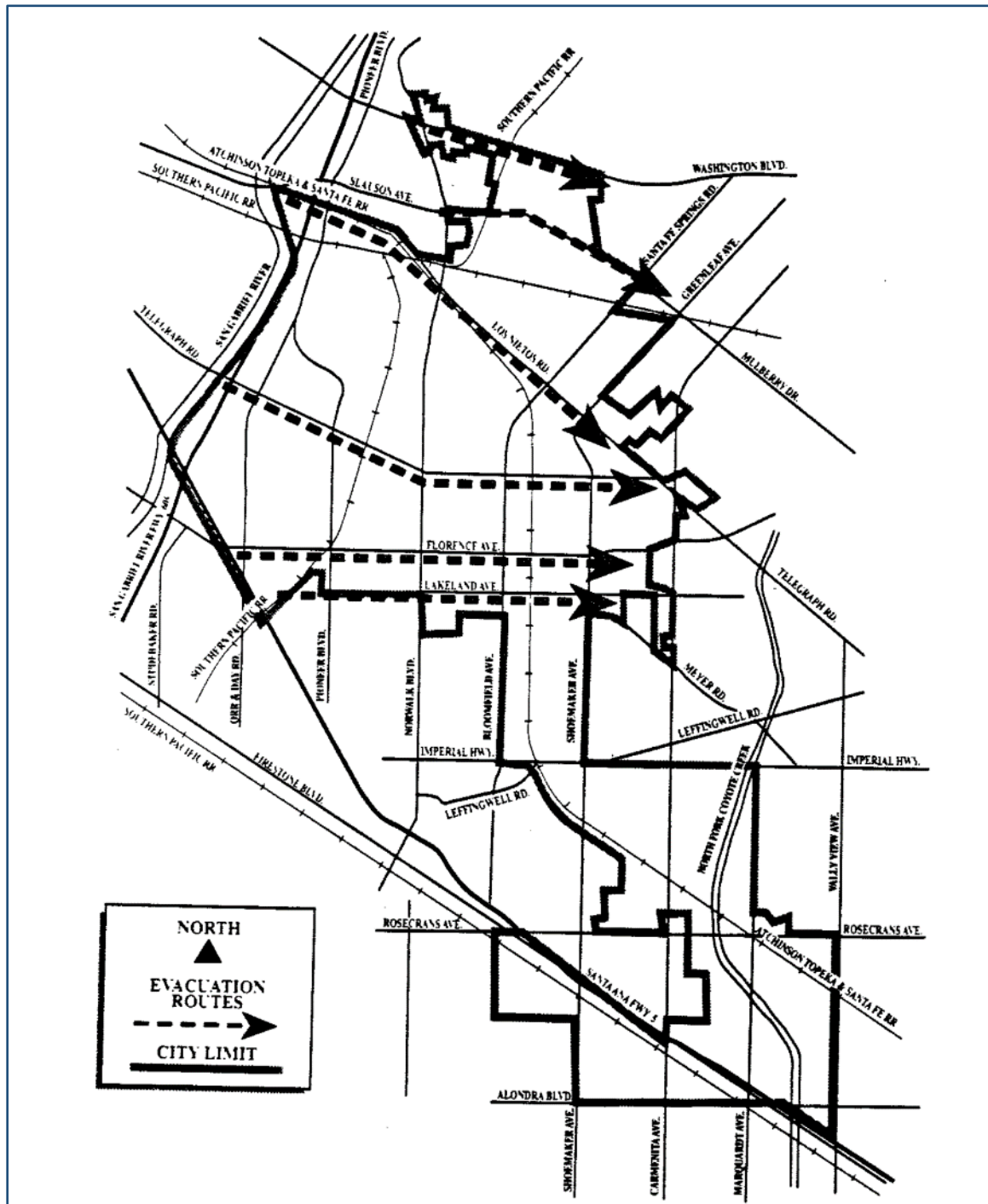
Economic Losses

The total economic loss estimated for the Whittier Narrows Dam failure scenario is **\$232.4 million dollars** which includes building and business interruption related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Economic Losses (\$ Dollars) – Whittier Narrows Dam Failure Scenario

Category	Estimated Loss (\$)
Building Loss	
Building	\$111,009,000
Content	\$118,533,000
Inventory	\$2,116,000
Business Interruption	
Income	\$150,000
Relocation	\$277,000
Rental Income	\$54,000
Wage	\$255,000
TOTAL	\$232,394,000

Map: Dam Failure Inundation Evacuation Routes
(Source: City of Santa Fe Springs General Plan – Safety Element | 1994)



Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Dam Failure in the City of Santa Fe Springs** below.

Impacts of Dam Failure in the City of Santa Fe Springs

Based on the risk assessment, it is evident that dam failures will continue to have potentially devastating economic impacts to certain areas of the City.

Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations are needed

Urban Fire Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Urban Fire in the City of Santa Fe Springs** below.

Previous Occurrences of Urban Fires in the City of Santa Fe Springs

The City of Santa Fe Springs was most recently affected by an urban fire on March 13, 2017 when a traffic collision led to a sheared fire hydrant, downed power lines and a large commercial warehouse fire.



Previous Occurrences of Urban Fire in Los Angeles County

A large percentage of structure fires in Los Angeles County occur in places where people live. The leading cause of these fires is heat from electrical equipment, matches and lighters, electrical short-circuit or arc, and heat from wood- or paper-fueled equipment. Such equipment includes electric stoves, portable space heaters, and electric heaters.

Most cities in Los Angeles County have hotels, businesses, and educational buildings, the second leading type of buildings in which fires occur. In the core of the population centers, buildings are situated closely together.

At times, fire separation walls have been modified in such a way that fire walls could be breached, so the spread of fire due to the lack of firewalls could be a problem. Most of Los Angeles County's population centers consist of closely situated multiple office buildings, small businesses, warehouses, and restaurants. In these areas, there is a moderate risk of a fast-spreading multiple-structure fire. Other parts of the county are spread out enough so that the chances of a large structural fire traveling from one building to another, or to multiple other buildings, is relatively low.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

According to the City's General Plan - Safety Element (1994), Santa Fe Springs is a highly industrialized community and as such is susceptible to a variety of urban fires occurring in developed areas which could destroy buildings and other man-made structures. Fires are often due to accidents, carelessness, faulty wiring or electrical equipment, and are exacerbated by combustible modern construction materials, the absence of fire alarms and sprinkler systems, and the presence of fire-supporting chemicals.

The City's historic position as a major oil field and producer of recovered unrefined oil, creates a source of significant combustion and urban fire. The City's oil fields have 149 active producer well sites, 47 active water injection wells, 133 inactive producer wells, and 8 inactive water injection well sites. There are 8 oil industry tank farms and compression plants. **Map: Urban Fire Risks – Methane Zones** designates the areas within the City that pose hazards as potential sites for oil-field related fires.

The City of Santa Fe Springs has a number of known underground hazardous liquid pipelines. Typically, these pipelines are high pressure (300 to 600 psi) and contain either refined or unrefined petroleum product or natural gas. Although the likelihood of significant fire hazards from failures in transmission pipelines is minimal within the City of Santa Fe Springs, the hazard does exist, particularly to the extent that the pipeline impacts adjacent uses. Lines are typically at a minimum of 42 inches below the surface. Because of the City's significant history as a major oil field, the potential of unmapped pipelines exists, although there is a low probability of there being any pressurized transmission lines. **Map: Urban Fire Risks – Underground Pipelines** designates the location of all known hazardous liquid transmission lines within the City of Santa Fe Springs. Pipelines are regulated by the Office of Pipeline Safety, U.S. Department of Transportation, and by the State Fire Marshall.

Outside above-ground storage tanks in which flammable or combustible liquids can be stored are a potential fire hazard. Within the City there are approximately 1,170 above ground tanks storing flammable or combustible liquids. Such fires can extend to adjacent structures or storage tanks and can result in explosions which could cause extensive property damage and loss of life.

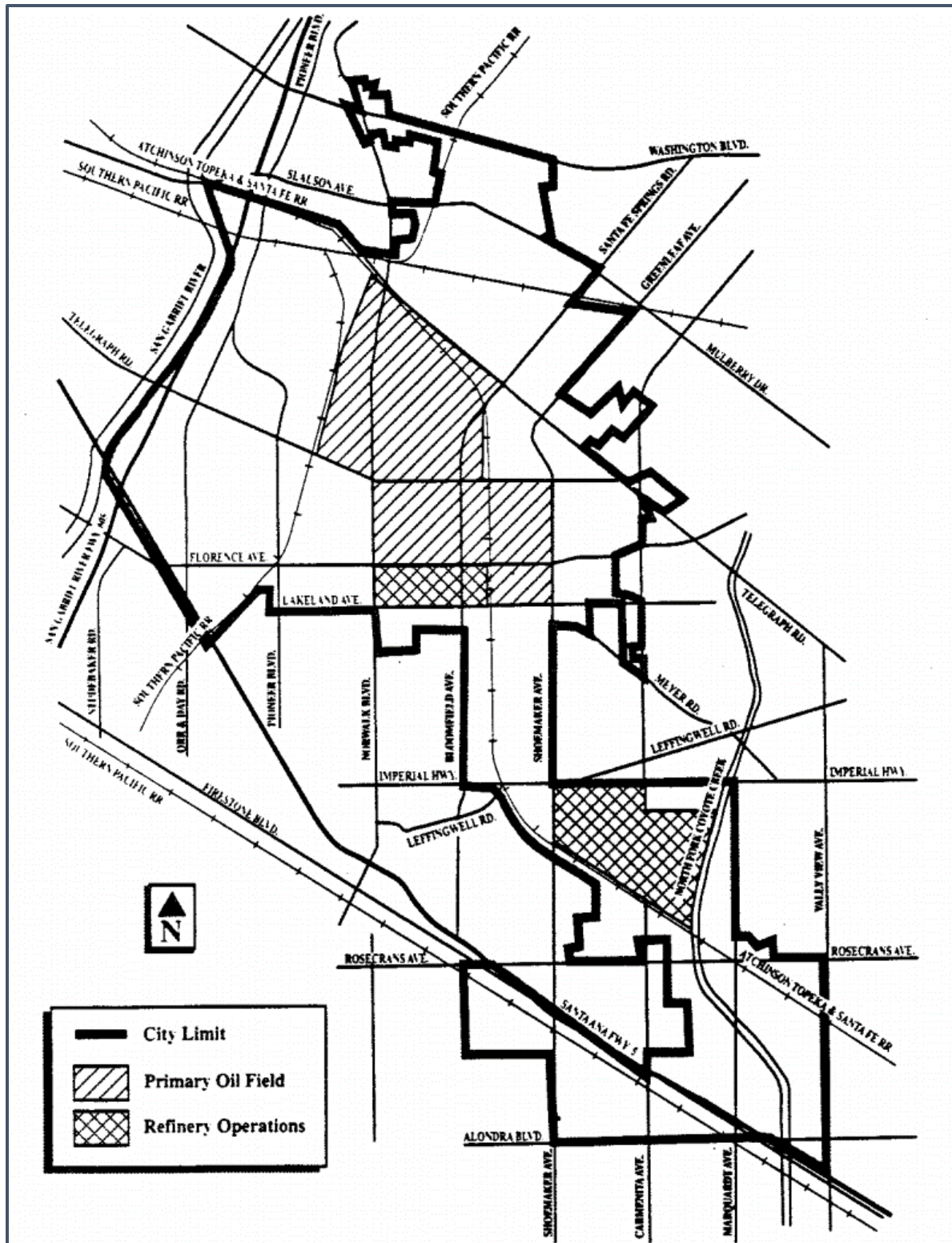
During the writing of the 2018 update to the Hazard Mitigation Plan, the Fire Chief was asked for an estimate on the extent of a worse-case scenario for Urban Fire. Following was his response:

“Urban Fires in the City of Santa Fe Springs have the potential of becoming a conflagration if particular weather-related events were to occur and there was a loss of water supply, or acceleration from another source such as flammables or natural gas line. This would cripple firefighting efforts and place the demand for additional resources to be called utilizing Mutual Aid or Automatic Aid agreements. If a Santa Ana wind event occurred and there was enough initial fire spread, there is the potential of large loss of life and property due to local resources being overwhelmed by a wind-driven fire event.

As a recent example of an Urban fire in a commercial building area, a highly combustible material ignited, extending to an outside chemical storage area. Within a few minutes, three commercial buildings became fully involved in fire and required the use of several outside agencies. This was a large blaze that burned for several hours. Santa Fe Springs’ entire Fire Department and another 50 firefighters and resources from several surrounding communities assisted in fire suppression.

The Santa Fe Springs Department of Fire-Rescue has a daily staffing of 15 firefighters and command staff that operates Three fire engines, one truck company, one paramedic squad, and one Battalion Chief. Any fire operation over initial assignment for a structure fire requires that additional resources be utilized. The amount of resources depends on the size of the incident.”

Map: Urban Fire Risks – Oil Production Facilities
(Source: City of Santa Fe Springs General Plan – Safety Element, 1994)



Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Urban Fires in the City of Santa Fe Springs** below.

Impact of Urban Fires in the City of Santa Fe Springs

Based on the risk assessment, it is evident that urban fires will continue to have a potentially devastating economic impact to certain areas of the City.

Impact that is not quantified, but anticipated in future events includes:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed

Hazardous Materials Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Hazardous Materials in the City of Santa Fe Springs** below.

Previous Occurrences of Hazardous Materials in the City of Santa Fe Springs

The City of Santa Fe Springs was most recently affected by a hazardous material release in August 2015 when a 40,000-pound Airgas, Inc. tanker began to leak carbon dioxide. The leak was reported around 2 a.m. at Airgas, Inc., a dry ice production company in the 9800 block of Jordan Circle. Firefighters responded to a report of tanker leaking carbon dioxide behind the building, according to Santa Fe Springs Fire Department. One person was injured and sent to a local hospital with non-life threatening injuries.



Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

According to the City's General Plan - Safety Element (1994), the oil field and chemical production industry history of the City has led to a significant number of contaminated properties. Soils contamination is a major factor in the development of most remaining undeveloped land within the City.

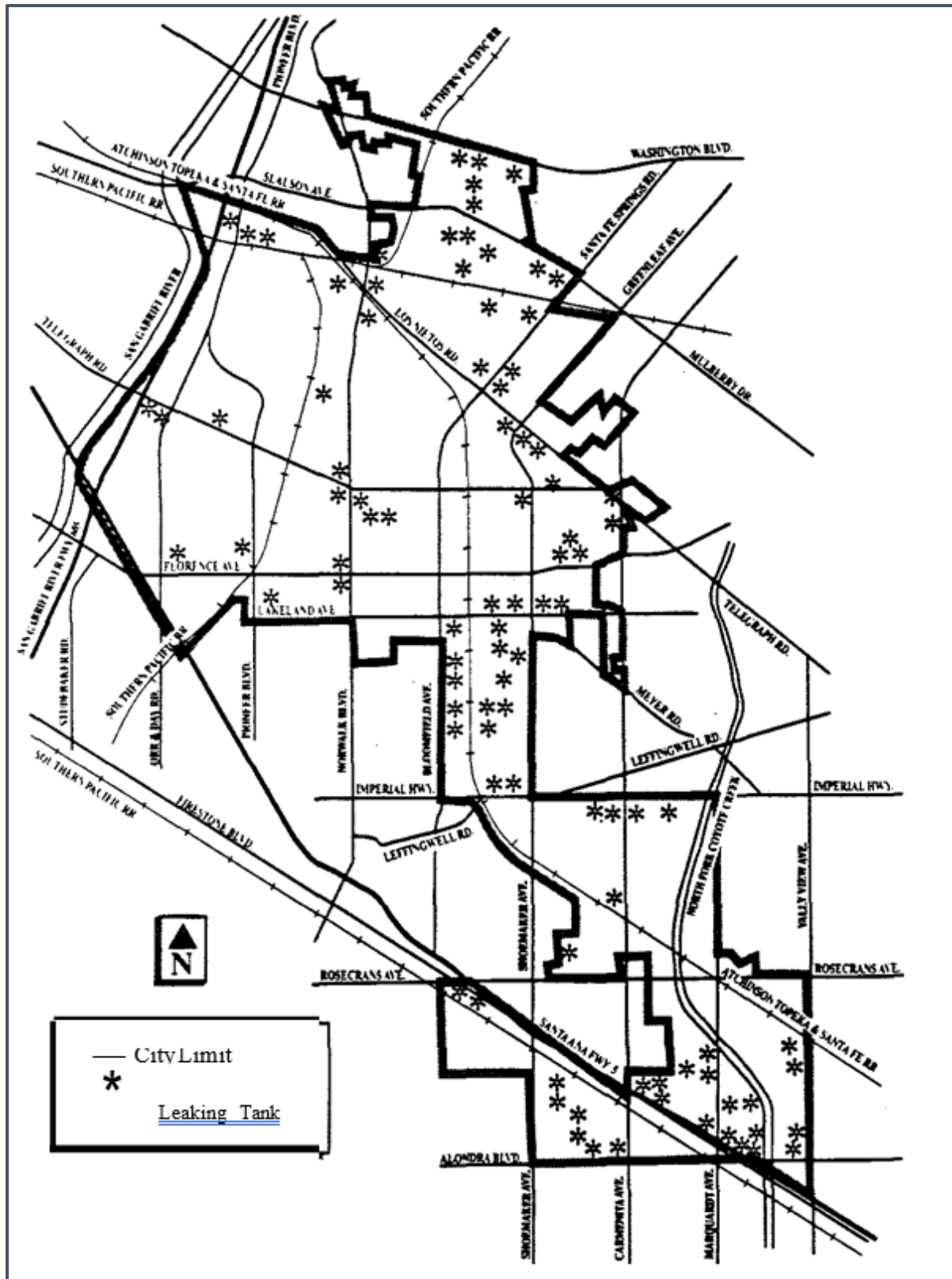
Underground Storage Tanks

Pursuant to Section 25295 (b) of the California Health and Safety Code, the California Water Resources Control Board, in cooperation with the State Office of Emergency Services, compiles a listing of leaks of hazardous substances from underground storage tanks in the State of California. The Board takes the lead in overseeing investigations and taking remedial actions. Sites listed by the Board have had at least one known leak, although it is not uncommon for more than one leak to have occurred to multiple tanks at each site. There are 105 sites within the City of Santa Fe Springs that are on this list. **Map: Underground Leaking Tanks** shows the locations of these sites.

There are 450 underground tanks within the City of Santa Fe Springs. These are located at 142 separate sites, of which 77 are businesses with multiple tanks.

Map: Underground Leaking Tanks

(Source: City of Santa Fe Springs General Plan – Safety Element, 1994)



Hazardous Waste Generators

The City of Santa Fe Springs has identified both the number of generators and users and the approximate quantities of hazardous waste materials disposed of annually within the City.

There are approximately 1,200 industrial users or generators of hazardous materials within the City. This represents 28% of the City's businesses, a significantly high proportion of uses. The residential community also generates lower levels of hazardous waste. Records of the locations of all industrial generators and/or users are maintained by the Santa Fe Springs Fire Department.

Of particular note on this list of generators are two oil refineries, having major capacities for the processing and above-ground storage of un-refined and refined petroleum products. Unique to these uses is the presence of hydrofluoric acid used in the refining process.

It is estimated that businesses and households within the City generate over 15,000 tons of hazardous waste per year. It is also estimated that household hazardous waste makes up approximately 28 tons per year or only 0.19% of the total hazardous waste generated. The major categories of wastes generated in the City are waste oil, 3,000 tons; non-halogenated organic sludges and solids, 2,000 tons; metal containing liquids, 1,500 tons; non-metallic inorganic liquids, 1,600 tons; and miscellaneous wastes, 6,900 tons.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Hazardous Materials in the City of Santa Fe Springs** below.

Impact of Hazardous Materials in the City of Santa Fe Springs

Based on the risk assessment, it is evident that hazardous materials will continue to have a potentially devastating economic impact to certain areas of the City.

Impact that is not quantified, but anticipated in future events includes:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values

Significant disruption to students and teachers as temporary facilities and relocations would likely be needed

PART III: MITIGATION STRATEGIES

Mitigation Strategies

Overview of Mitigation Strategy

As the cost of damage from natural disasters continues to increase nationwide, the City of Santa Fe Springs recognizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation Plans assist communities in reducing risk from natural hazards by identifying resources, information and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The plan provides a set of action items to reduce risk from natural hazards through education and outreach programs, and to foster the development of partnerships. Further, the plan provides for the implementation of preventative activities, including programs that restrict and control development in areas subject to damage from natural hazards.

The resources and information within the Mitigation Plan:

1. Establish a basis for coordination and collaboration among agencies and the public in the City of Santa Fe Springs;
2. Identify and prioritize future mitigation projects; and
3. Assist in meeting the requirements of federal assistance programs

The Mitigation Plan is integrated with other City plans including the City of Santa Fe Springs Emergency Operations Plan, General Plan as well as department-specific standard operating procedures.

Mitigation Measure Categories

Following is FEMA's list of mitigation categories. The activities identified by the Planning Team are consistent with the six broad categories of mitigation actions outlined in FEMA publication 386-3 *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies*.

- ✓ **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- ✓ **Property Protection:** Actions that involve modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- ✓ **Public Education and Awareness:** Actions to inform and educate citizens, property owners, and elected officials about hazards and potential ways to mitigate them.
Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

- ✓ **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses preserve or restore the functions of natural systems. Examples include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- ✓ **Emergency Services:** Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- ✓ **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, retaining walls, and safe rooms.

Q&A | ELEMENT C. MITIGATION STRATEGY | C3

Q: Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))

A: See **Goals** below.

Goals

The Planning Team developed mitigation goals to avoid or reduce long-term vulnerabilities to hazards. These general principles clarify desired outcomes.

The goals are based on the risk assessment and Planning Team input, and represents a long-term vision for hazard reduction or enhanced mitigation capabilities. They are compatible with community needs and goals expressed in other planning documents prepared by the City.

Each goal is supported by mitigation action items. The Planning Team developed these action items through its knowledge of the local area, risk assessment, review of past efforts, identification of mitigation activities, and qualitative analysis.

The five mitigation goals and descriptions are listed below.

Protect Life and Property

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

Improve hazard assessment information to make recommendations for avoiding new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural, human-caused, and technological hazards.

FEMA defines **Goals** as general guidelines that explain what you want to achieve. They are usually broad policy-type statements, long-term, and represent global visions.

FEMA defines **Mitigation Activities** as specific actions that help you achieve your goals and objectives.

Enhance Public Awareness

Develop and implement education and outreach programs to increase public awareness of the risks associated with natural, human-caused, and technological hazards.

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

Preserve Natural Systems

Support management and land use planning practices with hazard mitigation to protect life.

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

Encourage Partnerships and Implementation

Strengthen communication and coordinate participation with public agencies, citizens, non-profit organizations, business, and industry to support implementation.

Encourage leadership within the City and public organizations to prioritize and implement local and regional hazard mitigation activities.

Strengthen Emergency Services

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

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

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

The Planning Team also developed hazard-specific mitigation goals, which appear in the **Mitigation Strategies Section**.

How are the Mitigation Action Items Organized?

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the timeline for implementation.

The action items are organized within the following **Mitigation Actions Matrix**, which lists all of the multi-hazard (actions that reduce risks for more than one specific hazard) and hazard-specific action items included in the mitigation plan. Data collection and research and the public participation process resulted in the development of these action items. The Matrix includes the following information for each action item:

Funding Source

The action items can be funded through a variety of sources, possibly including: operating budget/general fund, development fees, Community Development Block Grant (CDBG), Hazard Mitigation Grant Program (HMGP), other Grants, private funding, Capital Improvement Plan, and other funding opportunities.

Planning Mechanism

It's important that each action item be implemented. Perhaps the best way to ensure implementation is through integration with one or many of the City's existing "planning mechanisms" including the General Plan, Capital Improvement Program, General Fund and Grants. Opportunities for integration will be simple and easy in cases where the action item is already compatible with the content of the planning mechanism. As an example, if the action item calls for the creation of a floodplain ordinance and the same action is already identified in the General Plan's policies, then the General Plan will assist in implementation. On the contrary, if preparation of a floodplain ordinance is not already included in the General Plan policies then the item will need to be added during the next update to the General Plan. The General Plan was last updated in 1994 and was used as a resource throughout the Mitigation Plan. Hopefully by the time the Mitigation Plan is next updated in five years, a new General Plan will be available including an up-to-date Safety Element.

The Capital Improvement Program, depending on the budgetary environment, is updated every 5 years. The CIP includes infrastructure projects built and owned by the City. As such, the CIP is an excellent medium for funding and implementing action items from the Mitigation Plan. The Mitigation Actions Matrix includes several items from the existing CIP. The authors of the CIP served on the Planning Team and are already looking to funding addition Mitigation Plan action items in future CIPs.

The General Fund is the budget document that guides all of the City's expenditures and is updated on an annual basis. Although primarily a funding mechanism, it also includes descriptions and details associated with tasks and projects.

Grants come from a wide variety of sources – some annually and other triggered by events like disasters. Whatever the source, the City uses the General Fund to identify successful grants as funding sources.

Buildings & Infrastructure

This addresses the issue of whether or not a particular action item results in the reduction of the effects of hazards on new and existing buildings and infrastructure.

Coordinating Organization

The Mitigation Actions Matrix assigns primary responsibility for each of the action items. The hierarchies of the assignments vary – some are positions, others are departments, and others are committees. The primary responsibility for implementing the action items falls to the entity shown as the “Coordinating Organization”. The coordinating organization is the agency with regulatory responsibility to address hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, County, or regional agencies that are capable of or responsible for implementing activities and programs.

Plan Goals Addressed

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

The plan goals are organized into the following five areas:

- ✓ Protect Life and Property
- ✓ Enhance Public Awareness
- ✓ Preserve Natural Systems
- ✓ Encourage Partnerships and Implementation
- ✓ Strengthen Emergency Services

Q&A | ELEMENT C. MITIGATION STRATEGY | C5a.

Q: Does the plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Benefit/Cost Ratings** and **Priority Rating** below.

Benefit and Cost Ratings

The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review of the apparent benefits versus the apparent cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

High: Existing jurisdictional funding will not cover the cost of the action item so other sources of revenue would be required.

Medium: The action item could be funded through existing jurisdictional funding but would require budget modifications.

Low: The action item could be funded under existing jurisdictional funding.

Benefit ratings were defined as follows:

High: The action item will provide short-term and long-term impacts on the reduction of risk exposure to life and property.

Medium: The action item will have long-term impacts on the reduction of risk exposure to life and property.

Low: The action item will have only short-term impacts on the reduction of risk exposure to life and property.

Priority Rating

The Planning Team adopted the following process for rating the “priority” of each mitigation action item. Designations of “High”, “Medium”, and “Low” priority have been assigned to each action item using the following criteria:

Does the Action:

- ☐ solve the problem?
- ☐ address Vulnerability Assessment?
- ☐ reduce the exposure or vulnerability to the highest priority hazard?
- ☐ address multiple hazards?
- ☐ benefits equal or exceed costs?
- ☐ implement a goal, policy, or project identified in the General Plan or Capital Improvement Plan?

Can the Action:

- ☐ be implemented with existing funds?
- ☐ be implemented by existing state or federal grant programs?
- ☐ be completed within the 5-year life cycle of the LHMP?
- ☐ be implemented with currently available technologies?

Will the Action:

- ☐ be accepted by the community?
- ☐ be supported by community leaders?
- ☐ adversely impact segments of the population or neighborhoods?
- ☐ require a change in local ordinances or zoning laws?
- ☐ positive or neutral impact on the environment?
- ☐ comply with all local, state and federal environmental laws and regulations?

Is there:

- ☐ sufficient staffing to undertake the project?
- ☐ existing authority to undertake the project?

As mitigation action items were updated or written the Planning Team, representatives were provided worksheets for each of their assigned action items. Answers to the criteria above determined the priority according to the following scale.

- 1-6 = Low priority
- 7-12 = Medium priority
- 13-18 = High priority

Q&A | ELEMENT C. MITIGATION STRATEGY | C1b.

Q: Does the plan document each jurisdiction's ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))c

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C4a.

Q: Does the plan identify and analyze a comprehensive range (different alternatives) of specific mitigation actions and projects to reduce the impacts from hazards? (Requirement §201.6(c)(3)(ii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C4b.

Q: Does the plan identify mitigation actions for every hazard posing a threat to each participating jurisdiction? (Requirement §201.6(c)(3)(ii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C4c.

Q: Do the identified mitigation actions and projects have an emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C5a.

Q: Does the plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C5b.

Q: Does the plan identify the position, office, department, or agency responsible for implementing and administering the action/project, potential funding sources and expected timeframes for completion? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT D. MITIGATION STRATEGY | D1

Q: Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT D. MITIGATION STRATEGY | D2

Q: Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT D. MITIGATION STRATEGY | D3

Q: Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))

A: See **Mitigation Actions Matrix** below.

s Matrix below.

Mitigation Actions Matrix

Following is **Table: Mitigation Actions Matrix** which identifies the existing and future mitigation activities developed by the Planning Team.

Table: Mitigation Actions Matrix

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
MULTI-HAZARD ACTION ITEMS															
MH-1	Review existing inventories of City-owned at-risk buildings and infrastructure and prioritize mitigation projects and set priorities for inspection.	Public Works and Hazard Mitigation Planning Team (Planning Team)	1-5 years	X			X	X	Y	GF	GF	H	M	H	
MH-2	Develop, enhance, and implement education programs aimed at mitigating	Planning Team	Ongoing	X	X	X	X	X		GF	GF	H	L	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	hazards, and reducing the risk to citizens, public agencies, private property owners, businesses, and schools.														
MH-3	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.	Planning Team, Police Services	1-5 years	X			X			GF	GF	H	L	H	
MH-4	Strengthen emergency operations by increasing collaboration and coordination among	Planning Team, Police Service Department	Ongoing	X	X		X	X		GF	GF	H	L	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	public agencies, non-profit organizations, business, and industry.														
MH-5	Continue to identify and retrofit City-owned highway bridges, tunnels, and underpasses in need of retrofit (e.g. Alondra, Shoemaker, Carmenita, Valley View).	Planning Team, Public Works	5 years	X				X	Y	GF	GF	H	L	H	
MH-6	Identify City-owned buildings for use as emergency shelters.	Planning Team, Police Services, Public Works	Ongoing	X			X	X		GF	GF	H	L	H	
MH-7	Install and improve back-up power in critical and essential facilities.	Planning Team	Ongoing	X			X		Y	GF	GF	H	L	H	2017 Note: Police Services and Fire Stations

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
															already in progress
MH-8	Maintain and buy layers for GIS system and provide training to pertinent staff.	Planning Team, Technical Committee	Ongoing	X			X			GF	GF	H	L	H	
MH-9	Educate the public about procedures for reporting human-caused incidents.	Public Relations, Police Services, Fire Department	Ongoing	X	X			X		GF	GF	H	L	H	
MH-10	Educate the public about emergency sheltering and evacuation procedures.	Public Relations, Police Services, Fire Department	Ongoing	X	X			X		GF	GF	H	L	H	
MH-11	Update Emergency Operations Plan to include "local disaster declaration"	Public Relations, Police Services, Fire Department	5 years	X	X			X		GF	GF	H	L	H	Last EOP update was 2014

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	examples as well as emergency public information handouts to be used following a major emergency or disaster.														
MH-12	Provide business continuity workshops for business owners to learn the importance of disaster mitigation and how to create an Emergency Operations Plan for their businesses.	Police Services	Annual	X	X		X	X		GF	GF	H	L	H	
MH-13	Purchase supplies and equipment for use in the EOC and a Mobile EOC. See	Police Services	1 year	X	X	X	X	X	Y	GR / GF	GR/GF	H	M	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	Appendix for detailed list.														
MH-14	Identify and pursue grant funding opportunity for a generator for Fire Station 4 on Telegraph Road. The addition of the generator would ensure balance of electrical power throughout the entire station at all times.	Fire	1-5 years	X			X		Y	GR	GR	H	M	H	
EARTHQUAKE ACTION ITEMS															
EQ-1	Identify funding sources for structural and non-structural retrofitting of City-owned structures	Public Works	Ongoing	X	X		X	X	Y	GR	GR	H	H	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	and infrastructure classified as seismically vulnerable.														
EQ-2	Integrate new earthquake hazard mapping data for the City of Santa Fe Springs and identify potential at-risk areas in Hazard Mitigation Plan as well as other regulatory documents (e.g. General Plan).	Public Works	Ongoing	X	X	X	X	X	Y	GF	GF	H	M	H	Begin update to General Plan in 2018
EQ-3	Information gained from seismic hazard mapping will be used to better refine risk.	Public Works	Ongoing	X	X	X	X	X		GF	GF	H	L	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	The first step is collection of geologic information on seismic sources, soil conditions, and related potential hazards. The second step is to prepare a map showing the approximate locations of various hazards. Map users should be educated in the appropriate uses and limitations of maps.														
FLOODING ACTION ITEMS															
FL-1	Work with Los Angeles County Flood Control District	Planning Team, Public Works, Fire, Police	1-5 years	X	X		X	X	Y	GR	GR	H	H	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	to develop better flood monitoring systems including underpasses and storm drains.														
FL-2	Install sensors in the storms drains to track blockages.	Public Works	1-5 years	X	X		X	X	Y	GR	GR	H	H	H	
FL-3	Use public outreach resources to: 1) advise homeowners of the risks to life, health, and safety, 2) facilitate technical assistance programs that address measures that citizens can take, and 3) facilitate funding for mitigation	Planning Team, Public Works, Recreation, Police, Fire	1-5 years	X	X		X	X		GF / GR	GF/GR	H	H	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	measures. Driver safety strategies for flooded areas should be addressed through driver safety/education classes and by the media. Local officials can be trained on flood fighting, flood proofing, traffic control during flooding, and other measures.														
DAM FAILURE ACTION ITEMS															
DF-1	Continue to work closely with Army Corps of Engineers on status and repairs	Public Works, Police Services	Ongoing	X	X	X	X	X		GR / GF	GR/GF	H	L	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	to the Whittier Narrows Reservoir.														
DF-2	Share information with the citizens and business owners concerning the evacuation in the event of a failure of the Whittier Narrows Reservoir.	Public Works, Police Services	1 year	X	X	X	X	X		GF	GF	H	L	H	
HAZARDOUS MATERIALS ACTION ITEMS															
HM-1	Integrate major hazardous materials event into all future disaster exercises.	Police, Fire	Ongoing	X	X	X	X	X		GR / GF	GR/GF	H	L	H	
URBAN FIRE ACTION ITEMS															
UF-1	Work with community members and schools to encourage public	Fire	Ongoing	X	X	X	X	X		GR / GF	GR/GF	H	L	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments
	education and school programs, especially regarding stoves, heaters, fireworks, matches/lighters, smoke detectors, and evacuation.														
UF-2	Encourage citizens to install and maintain fire extinguishers, smoke detectors, and carbon dioxide monitors in homes and businesses.	Fire	Ongoing	X	X	X	X	X	Y	GF	GF	H	L	H	
UF-3	Enforce existing fireworks regulations.	Fire	Ongoing	X	X	X	X	X	Y	GF	GF	H	L	H	

Plan Maintenance

The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan update every five years. This section describes how the City will integrate public participation throughout the plan maintenance process.

Method and Scheduling of Plan Implementation

The Planning Team that was involved in research and writing of the Plan will also be responsible for implementation. The Planning Team will be led by the Chair of the Planning Team and will be referred to as the Local Mitigation Officer.

	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring	X	X	X	X	X
Evaluating					X
Internal Planning Team Evaluation	X	X	X	X	X
Cal OES and FEMA Evaluation					X
Updating					X

Monitoring and Implementing the Plan

Plan Adoption

The City Council will be responsible for adopting the Mitigation Plan. This governing body has the authority to promote sound public policy regarding hazards. Once the plan has been adopted, the Local Mitigation Officer will be responsible for submitting it to the State Hazard Mitigation Officer at California Office of Emergency Services (Cal OES). Cal OES will then submit the plan to the Federal Emergency Management Agency (FEMA) for review and approval. This review will address the requirements set forth in 44 C.F.R. Section 201.6 (Local Mitigation Plans). Upon acceptance by FEMA, City of Santa Fe Springs will gain eligibility for Hazard Mitigation Grant Program funds.

Local Mitigation Officer

Under the direction of the Local Mitigation Officer, the Planning Team will take responsibility for plan maintenance and implementation. The Local Mitigation Officer will facilitate the Planning Team meetings and will assign tasks such as updating and presenting the Plan to the members of the Planning Team. Plan implementation and evaluation will be a shared responsibility among the Planning Team members. The Local Mitigation Officer will coordinate with City leadership to ensure funding for 5-year updates to Plan as required by FEMA.

The Planning Team will be responsible for coordinating implementation of plan action items and undertaking the formal review process. The Local Mitigation Officer will be authorized to make changes in assignments to the current Planning Team.

The Planning Team will meet on an annual basis to review the status of the mitigation action items. Meeting dates will be scheduled once the final Planning Team has been established. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan.

Q&A | ELEMENT C. MITIGATION STRATEGY | C6a.

Q: Does the plan identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated? (Requirement §201.6(c)(4)(ii))

A: See **Implementation through Existing Program** below.

Implementation through Existing Programs

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

The City of Santa Fe Springs Planning Division is responsible for adhering to the State of California's Building and Safety Codes. In addition, the Planning Team will work with other agencies at the state level to review, develop and ensure Building and Safety Codes are adequate to mitigate or present damage by hazards. This is to ensure that life-safety criteria are met for new construction.

Some of the goals and action items in the Mitigation Plan will be achieved through activities recommended in the CIP. Various City departments develop the CIP and review it on an annual basis. Upon annual review of the CIP, the Planning Team will work with the City departments to identify areas that the Mitigation Plan action items are consistent with CIP goals and integrate them where appropriate.

As indicated in the **Mitigation Actions Matrix**, several action items have been added to ensure implementation through other existing planning mechanisms. Also, the **Table: Capability Assessment: Existing Processes and Programs** identifies the need to maintain balance and diversify the Hazard Mitigation Planning Team to accomplish an efficient and effective implementation of the Plan. The 2017 Plan's success will be ensured by the following:

- Diversity of Planning Team membership
- Quarterly implementation meetings and reporting
- Including Planning Team in review of development projects
- Sharing Mitigation Plan with Community Development Department and Public Works Department

Upon FEMA approval, the Planning Team will begin the process of incorporating existing planning mechanisms at the City level. The meetings of the Planning Team will provide an opportunity for Planning Team members to report back on the progress made on the integration of mitigation planning elements into City planning documents and procedures.

Economic Analysis of Mitigation Projects

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

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

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

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

The “benefit”, “cost”, and overall “priority” of each mitigation action item was included in the Mitigation Actions Matrix located in Part III: Mitigation Strategies. A more technical assessment will be required in the event grant funding is pursued through the Hazard Mitigation Grant Program. FEMA Benefit-Cost Analysis Guidelines are discussed below.

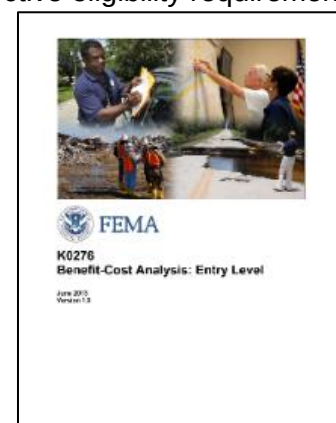
FEMA Benefit-Cost Analysis Guidelines

The Stafford Act authorizes the President to establish a program to provide technical and financial assistance to state and local governments to assist in the implementation of hazard mitigation measures that are cost effective and designed to substantially reduce injuries, loss of life, hardship, or the risk of future damage and destruction of property. To evaluate proposed hazard mitigation projects prior to funding FEMA requires a Benefit-Cost Analysis (BCA) to validate cost effectiveness. BCA is the method by which the future benefits of a mitigation project are estimated and compared to its cost. The end result is a benefit-cost ratio (BCR), which is derived from a project’s total net benefits divided by its total project cost. The BCR is a numerical expression of the cost effectiveness of a project. A project is considered to be cost effective when the BCR is 1.0 or greater, indicating the benefits of a prospective hazard mitigation project are sufficient to justify the costs.

Although the preparation of a BCA is a technical process, FEMA has developed software, written materials, and training to support the effort and assist with estimating the expected future benefits over the useful life of a retrofit project. It is imperative to conduct a BCA early in the project development process to ensure the likelihood of meeting the cost-effective eligibility requirement in the Stafford Act.

The BCA program consists of guidelines, methodologies and software modules for a range of major natural hazards including:

- ✓ Flood (Riverine, Coastal Zone A, Coastal Zone V)
- ✓ Hurricane Wind
- ✓ Hurricane Safe Room
- ✓ Damage-Frequency Assessment
- ✓ Tornado Safe Room
- ✓ Earthquake
- ✓ Wildfire



The BCA program provides up to date program data, up to date default and standard values, user manuals and training. Overall, the program makes it easier for users and evaluators to conduct and review BCAs and to address multiple buildings and hazards in a single BCA module run.

Q&A | ELEMENT A: PLANNING PROCESS | A6a.

Q: Does the plan identify how, when, and by whom the plan will be **monitored** (how will implementation be tracked) over time? (Requirement §201.6(c)(4)(i))

A: See **Monitoring the Plan** below.

Q&A | ELEMENT A: PLANNING PROCESS | A6c.

Q: Does the plan identify how, when, and by whom the plan will be **updated** during the 5-year cycle? (Requirement §201.6(c)(4)(i))

A: See **Monitoring the Plan** below.

Monitoring the Plan

Under the direction of the Local Mitigation Officer, the Planning Team will take responsibility for plan maintenance and implementation. Annual meetings will be established to ensure the identified mitigation action items are being accomplished. On the fifth year of the planning cycle, the Planning Team will meet to evaluate the effectiveness of the planning process and to update the overall content of the Plan. The Local Mitigation Officer will coordinate with City leadership to ensure funding for 5-year updates to Plan as required by FEMA.

The Planning Team will be responsible for coordinating implementation of plan by monitoring the progress of the mitigation action items and documenting progress notes for each item. It will be up to the Local Mitigation Officer to hold either a live meeting versus tasking the coordinating agencies with status updates on their own assigned mitigation action items. The monitoring meetings will take place no less than annually. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan. See the **Annual Implementation Report** discussed below which will be a valuable tool for the Planning Team to measure the success of the Hazard Mitigation Plan. The focus of the annual meetings will be on the progress and changes to the Mitigation Action Items.

Annual Implementation Report

The Annual Implementation Report is the same as the Mitigation Action Matrix but with a column added to the far right to track the annual status of each Action Item. Upon approval and adoption of the Plan, the entire Annual Implementation Report will be added to the Appendix of the Plan. Following is a view of the Annual Implementation Report:

Annual Implementation Report

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status Comments
MULTI-HAZARD ACTION ITEMS															
MH-1	Review existing inventories of City-owned at-risk buildings and infrastructure and prioritize mitigation projects and set priorities for inspection.	Public Works and Hazard Mitigation Planning Team (Planning Team)	1-5 years	X			X	X		GF	GF	H	M	H	

An equally part of the monitoring process is the need to maintain a strategic planning process which needs to include funding and organizational support. In that light, at least one year in advance of the FEMA-mandated 5-year submission of an update, the Local Mitigation Officer will convene the Planning Team to discuss funding and timing of the update planning process.

On the fifth year of the planning cycles, the Planning Team will broaden its scope to include discussions and research on all of the sections within the Plan with particular attention given go goal achievement and public participation.

Q&A | ELEMENT A: PLANNING PROCESS | A6b.

Q: Does the plan identify how, when, and by whom the plan will be **evaluated** (assessing the effectiveness of the plan at achieving stated purpose and goals) over time? (Requirement §201.6(c)(4)(i))

A: See **Evaluating and Updating the Plan** below.

Evaluating and Updating the Plan

Formal Update Process

The Mitigation Plan will be monitored on a quarterly basis to determine the effectiveness of mitigation action items and to reflect changes in land development or programs that may affect mitigation actions or their priorities. The evaluation process includes a firm schedule and timeline, and identifies the agencies and organizations participating in plan evaluation. The Local Mitigation Officer or designee will be responsible for contacting the Planning Team members and organizing the quarterly meeting. Planning Team members will also be responsible for participating in the formal update to the Plan every fifth year of the planning cycle.

The Planning Team will review the goals and mitigation action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Planning Team will also review the Plan's **Risk Assessment** portion of the Plan to determine if this information should be updated or modified, given any new available data. The **coordinating organizations** responsible for the various action items will report on the status of their projects, including the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised. Amending will be made to the Mitigation Actions Matrix and other sections in the Plan as deemed necessary by the Planning Team.

Q&A | ELEMENT A: PLANNING PROCESS | A5

Q: Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))

A: See **Continued Public Involvement** below.

Continued Public Involvement

The City of Santa Fe Springs is dedicated to involving the public directly in the continual review and updates to the Mitigation Plan. Copies of the plan will be catalogued and made available at City Hall and at all City operated public libraries. The existence and location of these copies will be publicized in City newsletters and on the City website. This site will also contain an email

address and phone number where people can direct their comments and concerns. A public meeting will also be held after each evaluation or when deemed necessary by the Planning Team. The meetings will provide the public a forum in which they can express their concerns, opinions, or ideas about the Plan.

The Local Mitigation Officer will be responsible for using City resources to publicize the annual public meetings and maintain public involvement through the public access channel, web page, and newspapers.

PART IV: APPENDIX

General Hazard Overviews

Earthquake Hazards

Measuring and Describing Earthquakes

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. 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. Ground motion is the vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can further amplify ground motions. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. One way to express an earthquake's severity is to compare its acceleration to the normal acceleration due to gravity. The acceleration due to gravity is often called "g". A ground motion with a peak ground acceleration of 100%g is very severe. Peak Ground Acceleration (PGA) is a measure of the strength of ground motion. PGA is used to

When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter.

project the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%, 5%, or 2%) of being exceeded in 50 years. These ground motion values are used for reference in construction design for earthquake resistance. The ground motion values can also be used to assess relative hazard between sites, when making economic and safety decisions.

Another tool used to describe earthquake intensity is the Magnitude Scale. The Magnitude Scale is sometimes referred to as the Richter Scale. The two are similar but not exactly the same. The Magnitude Scale was devised as a means of rating earthquake strength and is an indirect measure of seismic energy released. The Scale is logarithmic with each one-point increase corresponding to a 10-fold increase in the amplitude of the seismic shock waves generated by the earthquake. In terms of actual energy released, however, each one-point increase on the Richter scale corresponds to about a 32-fold increase in energy released. Therefore, a Magnitude 7 (M7)

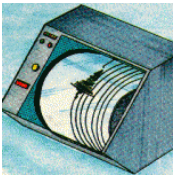
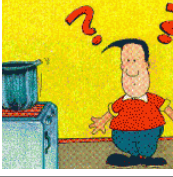
earthquake is 100 times (10×10) more powerful than a M5 earthquake and releases 1,024 times (32×32) the energy.

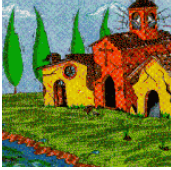
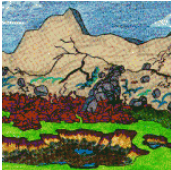
An earthquake generates different types of seismic shock waves that travel outward from the focus or point of rupture on a fault. Seismic waves that travel through the earth's crust are called body waves and are divided into primary (P) and secondary (S) waves. Because P waves move faster (1.7 times) than S waves, they arrive at the seismograph first. By measuring the time delay between arrival of the P and S waves and knowing the distance to the epicenter, seismologists can compute the magnitude for the earthquake.

The duration of an earthquake is related to its magnitude but not in a perfectly strict sense. There are two ways to think about the duration of an earthquake. The first is the length of time it takes for the fault to rupture and the second is the length of time shaking is felt at any given point (e.g. when someone says "I felt it shake for 10 seconds" they are making a statement about the duration of shaking). (Source: www.usgs.gov)

The Modified Mercalli Scale (MMI) is another means for rating earthquakes, but one that attempts to quantify intensity of ground shaking. Intensity under this scale is a function of distance from the epicenter (the closer to the epicenter the greater the intensity), ground acceleration, duration of ground shaking, and degree of structural damage. The Modified Mercalli Intensity Scale below rates the level of severity of an earthquake by the amount of damage and perceived shaking.

Table: Modified Mercalli Intensity Scale

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	I	N/A	N/A	Not Felt
	II	N/A	N/A	Felt by persons at rest, on upper floors, or favorably placed.
	III	N/A	N/A	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
	IV	N/A	N/A	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motorcars rock. Windows, dishes, doors rattle. In the upper range of IV, wooden walls and frame creak.
	V	Light	Pictures Move	Felt outdoors; direction estimated. Sleepers awakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clock stop, start, change rate.

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	VI	Moderate	Objects Fall	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked.
	VII	Strong	Nonstructural Damage	Difficult to stand. Noticed by drivers of motorcars. Hanging objects quiver. Furniture broken. Damage to masonry, including cracks. Weak chimneys broken at roofline. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Small slides and caving in along sand or gravel banks. Concrete irrigation ditches damaged.
	VIII	Very Strong	Moderate Damage	Steering of motorcars affected. Damage to masonry C, partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, and elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Cracks in wet ground and on steep slopes.
	IX	Violent	Heavy damage	General panic. Damage to masonry buildings ranges from collapse to serious damage unless modern design. Wood-frame structures rack, and, if not bolted, shifted off foundations. Underground pipes broken.
	X	Very Violent	Extreme Damage	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land.
	XI	N/A	N/A	Rails bent greatly. Underground pipelines completely out of services.
	XII	N/A	N/A	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.

Earthquake Related Hazards

Ground shaking, landslides, liquefaction, and amplification are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake.

Ground Shaking

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter (where the earthquake originates). Buildings on poorly consolidated and thick soils will typically see more damage than buildings on consolidated soils and bedrock.

Seismic activity along nearby or more distant fault zones are likely to cause ground shaking within the City limits.

Earthquake-Induced Landslide Potential

Generally, these types of failures consist of rock falls, disrupted soil slides, rock slides, soil lateral spreads, soil slumps, soil block slides, and soil avalanches. Areas having the potential for earthquake-induced landslides generally occur in areas of previous landslide movement, or where local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacements.

Liquefaction

Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these structures. Liquefaction generally occurs during significant earthquake activity, and structures located on soils such as silt or sand may experience significant damage during an earthquake due to the instability of structural foundations and the moving earth. Many communities in Southern California are built on ancient river bottoms and have sandy soil. In some cases, the soil may be subject to liquefaction, depending on the depth of the water table.

Flood Hazards

Flood Terminology

Floodplain

A floodplain is a land area adjacent to a river, stream, lake, estuary, or other water body that is subject to flooding. This area, if left undisturbed, acts to store excess flood water. The floodplain is made up of two sections: the floodway and the flood fringe.

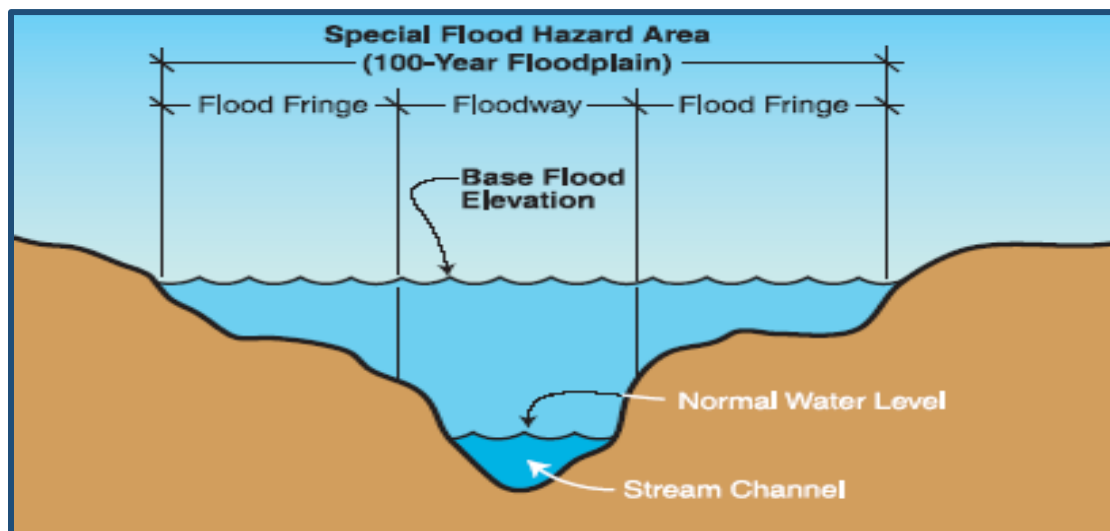
100-Year Flood

The 100-year flooding event is the flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood. Schematic: Floodplain and Floodway shows the relationship of the floodplain and the floodway.

The 100-year flooding event is the flood having a 1% chance of being equaled or exceeded in magnitude in any given year.

Contrary to popular belief, it is not a flood occurring once every 100 years.

Figure: Floodplain and Floodway
(Source: FEMA How-To-Guide Assessing Hazards)



Floodway

The floodway is one of two main sections that make up the floodplain. Floodways are defined for regulatory purposes. Unlike floodplains, floodways do not reflect a recognizable geologic feature. For NFIP purposes, floodways are defined as the channel of a river or stream, and the overbank areas adjacent to the channel. The floodway carries the bulk of the flood water downstream and is usually the area where water velocities and forces are the greatest. NFIP regulations require that the floodway be kept open and free from development or other structures that would obstruct or divert flood flows onto other properties.

Base Flood Elevation (BFE)

The term "Base Flood Elevation" refers to the elevation (normally measured in feet above sea level) that the base flood is expected to reach. Base flood elevations can be set at levels other than the 100-year flood. Some communities use higher frequency flood events as their base flood elevation for certain activities, while using lower frequency events for others. For example, for the purpose of storm water management, a 25-year flood event might serve as the base flood elevation; while the 500-year flood event serves as base flood elevation for the tie down of mobile homes. The regulations of the NFIP focus on development in the 100-year floodplain.

Types of Flooding

Two types of flooding primarily affect the City of Santa Fe Springs: slow-rise or flash flooding. Slow-rise floods in Santa Fe Springs may be preceded by a warning period of hours or days. Evacuation and sandbagging for slow-rise floods have often effectively lessened flood related damage. Conversely, flash floods are most difficult to prepare for, due to extremely limited, if any, advance warning and preparation time. Unlike most of California, the areas of Los Angeles County that are subject to slow-rise flooding are not associated with overflowing rivers, aqueducts, canals or lakes. Slow-rise flooding in Santa Fe Springs is usually the result of one or a combination of the following factors: extremely heavy rainfall, saturated soil, area recently burned in wild fires with inadequate new ground cover growth, or heavy rainfall with runoff from melting mountain snow.

Urban Flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds, to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in flood waters that rise very rapidly and peak with violent force.

The City of Santa Fe Springs has a high concentration of impermeable surfaces that either collect water, or concentrate the flow of water in unnatural channels. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

Definitions of FEMA Flood Zone Designations

Flood zones are geographic areas that the FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area.

Moderate to Low Risk Areas

In communities that participate in the NFIP, flood insurance is available to all property owners and renters in these zones:

ZONE	DESCRIPTION
B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C and X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.

High Risk Areas

In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones:

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.

ZONE	DESCRIPTION
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

Undetermined Risk Areas

ZONE	DESCRIPTION
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

Dam Failure Hazards

Hazard Characteristics

Definition

Dams are man-made structures built for a variety of uses including flood protection, power, agriculture, water supply, and recreation. When dams are constructed for flood protection, they usually are engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If a larger flood occurs, then that structure will be overtopped. Overtopping is the primary cause of earthen dam failure in the United States.

Failed dams can create floods that are catastrophic to life and property as a result of the tremendous energy of the released water. A catastrophic dam failure could easily overwhelm local response capabilities and require mass evacuations to save lives. Dams typically are constructed of earth, rock, concrete, or mine tailings. Two factors that influence the potential severity of a full or partial dam failure are the amount of water impounded and the density, type, and value of development and infrastructure located downstream.

Dam failures can result from any one or a combination of the following causes:

- ✓ Prolonged periods of rainfall and flooding, resulting in excess overtopping flows
- ✓ Earthquake
- ✓ Inadequate spillway capacity, resulting in excess overtopping flows
- ✓ Internal erosion caused by embankment or foundation leakage or piping
- ✓ Improper design
- ✓ Improper maintenance
- ✓ Negligent operation
- ✓ Failure of upstream dams on the same waterway

Since 1929, the State of California is responsible for overseeing dams to safeguard life and property (California Department of Resources, 1995). This legislation was prompted by the 1928 failure of St. Francis Dam. In 1965, the law was amended to include off stream storage reservoirs due to the 1963 failure of Baldwin Hill Reservoir. In 1973, Senate Bill 896 was enacted to require dam owners, under the direction of Cal OES, to show the possible inundation path in the event of a dam failure.

Governmental assistance could be required and continued for an extended period. These efforts are required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and welfare for the affected population including, as required, temporary housing for displaced persons.

Hazardous Materials Hazards

Hazard Characteristics

Definition

Hazardous materials are substances that are flammable, combustible, explosive, toxic, noxious, and corrosive, an oxidizer, an irritant, or radioactive. A hazardous material spill or release can pose a risk to life, health, or property. An incident can result in the evacuation of a few people, a section of a facility, or an entire neighborhood.



Hazardous Materials Transportation

Federal emergency planning requirements include the formation of local emergency planning committees (LEPCs). The LEPC is required to evaluate facilities using threshold quantities of extremely hazardous substances (EHS), and determine which facilities are at risk of a release or subject to additional risk due to their proximity to another facility using EHS. The LEPC is also required to identify hazardous materials transportation routes. This requirement has led Region I LEPC to develop a specific transportation element to its plan. The following represents the Region I transportation element:

Transportation of hazardous materials by air, land, or water poses a significant need to plan and coordinate emergency resources necessary to respond to hazardous materials spills and releases. These types of incidents could affect several million Californians and are potentially hazardous to both the local community, and those traveling near the incident site. First, we will discuss the different modes of transportation and the unique challenges presented for planners and emergency responders.

Air

The southern California region has several major air transportation facilities. In some instances, there may be hazardous materials incidents involving air cargo either on the aircraft or on the ground. Initial response to these incidents would be provided by airport emergency response personnel. The need may arise for additional resources to respond. Response efforts must be coordinated to ensure all personnel are made aware of the material involved and of the potential hazards. In the event of a crash of an aircraft, the major hazardous materials concerns will be fuel from the aircraft, hydraulic fluid, and oxygen systems. The threat posed by onboard hazardous cargo will be minimal. Regulations on hazardous materials shipments by air are found in 49 CFR section 175.

Water

Two major ports serve the southern California region. These are the Port of Los Angeles and the Port of Long Beach. The prime concern for these two major ports would be releases of petroleum products from both oil tankers and other large ocean-going vessels. Not only is there a significant potential from fire and explosion, the environmental effects could be catastrophic. Additionally, many other types of hazardous materials may be shipped by bulk or containerized cargo. Planners must recognize potential risks associated with vessels and port facilities in their hazard assessment. Response to water related incidents is coordinated through the Coast Guard and the California Department of Fish and Game.

Ground

Ground transportation provides the largest movement of hazardous materials and will generate the majority of incidents which will be confronted by local emergency response personnel. The three modes of ground transportation are rail, highway, and pipeline.

Rail is unique in both the quantity and types of hazardous materials which can be involved in one incident. Collisions, derailments, and mechanical failure, as well as loading and unloading, can all result in very serious hazardous materials incidents. A critical consideration for planners is a careful evaluation of the rail traffic in their jurisdiction. Rail companies as well as product manufacturers have emergency response teams available to assist local emergency responders. The United States Department of Transportation governs the transportation of hazardous materials by rail.

Highway-related hazardous materials incidents account for the vast majority of situations faced by local responders. Highway incidents range from minor releases of diesel fuel, to multiple vehicle accidents involving large quantities of multiple types of hazardous materials. A concern for planners is the fact that these incidents can occur anywhere throughout the region. Multiple agency coordination is essential for successful control and mitigation of these incidents. Section 2454 of the California Vehicle Code mandates authority for incident command at the scene of an on-highway hazardous substance incident in the appropriate law enforcement agency having primary traffic investigative authority on the highway where the incident occurs. The local governing body of the city may assign the authority to the local fire protection agency.

Pipeline incidents will typically involve compressed natural gas, or petroleum products. An important aspect for planners to consider is that pipelines are frequently out of sight and out of mind. Southern California region is honeycombed with underground pipelines ranging from a few inches to several feet in diameter. Pipelines transport products from as far away as Texas for use by local consumers. An important source of information on underground pipelines is Dig Alert. Regulation of pipeline activity is governed by the U.S. Department of Transportation and the California Public Utilities Commission.

Potential Effects of a Hazardous Materials Incident

As previously mentioned, highway accidents and incidents will constitute the majority of emergency response situations. There are two distinct facets which must be addressed in a local emergency action plan. Planners must consider the local community with fixed facilities and those individuals in transit. The following is illustrative of typical concerns which planners will encounter in addressing hazardous material occurrences.

Residential and Business Community

Chemical spills on streets and highways can impact the public in one or more of the following ways:

- ✓ Shelter-in-place
- ✓ Evacuations
- ✓ Restriction or detour of local traffic
- ✓ Damage to homes and businesses
- ✓ Injury, illness or death

Because of these potentially dangerous situations, it is necessary for emergency responders to be familiar with requirements for hazmat spill notification and to obtain and direct the resources necessary to protect public health and the environment.

Commuter/Delivery Traffic

In addition to the surrounding locale, travelers going through or near transportation incidents may be impacted in several ways:

- ✓ Exposure to harmful or flammable chemicals resulting in injury or illness
- ✓ Delayed travel
- ✓ Accidents
- ✓ Vehicle damage due to chemical contact

Agencies with on highway responsibility in LEPC Region I should become familiar with shipping corridors and traffic patterns.

Region I Transportation Needs

Research has indicated that the majority of hazardous materials incidents occur in the transportation arena. This fact strongly suggests that the region make the following recommendations for further transportation planning assessment:

- ✓ Identify various surface transporters within the region
- ✓ Determine level of training as it relates to transportation routes and notification requirements
- ✓ Evaluate emergency response resources for both public and private hazardous materials response teams
- ✓ Prioritize response resources in areas unable to respond to proportionally higher number of incidents.
- ✓ Develop standard guidelines for evacuation of populations impacted by transportation related incidents.
- ✓ Evaluate the need to perform Transportation Risk Assessment for selected high priority areas.



Attachments

FEMA Letter of Approval

City Council Staff Report

City Council Resolution

Planning Team Sign-In Sheets

City of Santa Fe Springs
Hazard Mitigation Plan
Planning Team Meeting #1
June 1, 2017

Name	Department
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DARRYL PEDIGO	POLICE SERVICES
CUONG NGUYEN	PLANNING
HERIBERTO VALDES	CODE ENFORCEMENT
Helio Espinoza	S.F.S. Public Works
Raul Diaz	Fire-Rescue
Sarina Morales-Choute	Public Works/Engineering

City of Santa Fe Springs
Hazard Mitigation Plan
Planning Team Meeting #2
July 6, 2017

Name	Department
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Brenda ten Bruggencate	Fire-Rescue
CUONG NGUYEN	PLANNING
HERIBERTO VALDES	CODE ENFORCEMENT
DARRYL PEDIGO	POLICE SERVICES

City of Santa Fe Springs
Hazard Mitigation Plan
Planning Team Meeting #3
August 3, 2017

Name	Department
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Raul Diaz	Fire-Rescue
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To whom it may concern,

The City of Santa Fe Springs is in the process of preparing its 2017 Hazard Mitigation Plan. Mitigation plans are regulated by the federal government through the Disaster Mitigation Act of 2000. The Plan is required to identify the natural hazards, however the City has opted to also include urban fires and human-caused and technological hazards in order to be better aware and prepared for a broader range of hazards. The Plan provides a list of mitigation action items that will be used to reduce the impacts from the identified hazards.

Part of the mandated approval process for the Plan requires the authoring jurisdiction to share the draft plan with key stakeholders and solicit comments during the "plan writing phase". Feel free to review the Draft Plan and share any comments with me by October 16, 2017. If you are not able to provide comments by that date, I will move forward with the understanding that you do not have any concerns and are comfortable with the Second Draft Plan as it is written.

Thank you in advance for your time and assistance with this project. I look forward to reading any comments that may come my way.

Darryl Pedigo, Lead Public Safety Officer
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<http://www.santafesprings.org/news/displaynews.asp?NewsID=461&TargetID=1>

William K. Rounds, Mayor • Jay Sarno, Mayor Pro Tem
City Council
Richard J. Moore • Juanita Trujillo • Joe Angel Zamora
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EOC Details List

ITEM
Flash drives
Lap tops/computers
Printers
EOC Vest
EOC Wall Boards
Street map boards/aerial-streets
Ham Radio
Generator
Police Radio/Batteries
Fire Radio/ Batteries
Police Charger Mobile
Fire Charger Mobile
Kenwood Radios/ Batteries
Kenwood Charger mobile
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