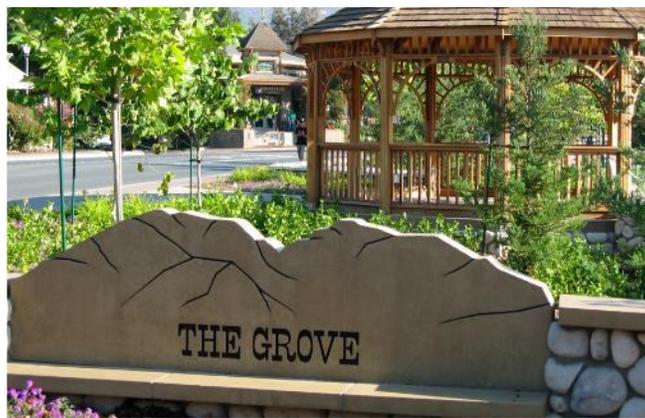
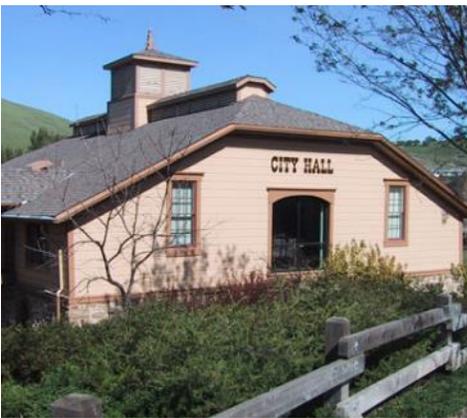


# October 12, 2021 | Hazard Mitigation Plan



# Credits

<b>ELEMENT A: PLANNING PROCESS   A1</b>
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))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A1b.</b>
<b>Q:</b> Does the plan list the jurisdiction(s) participating in the plan that are seeking approval? (Requirement §201.6(c)(1))
<b>A:</b> See <b>Hazard Mitigation Planning Team</b> and <b>Acknowledgements</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A1c.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Hazard Mitigation Planning Team</b> below.

## Hazard Mitigation Planning Team:

Name	Department	Position
<b>City of Clayton</b>		
Reina Schwartz, Chair	City Manager's Office	City Manager
Laura Hoffmeister	City Manager's Office	Assistant City Manager
Bill Stracker	Engineering Department	Contract City Engineer
Matthew Feske	Community Development Department	Former Community Development Director
Scott Alman	Engineering Department	Former Contract City Engineer
<b>Emergency Planning Consultants</b>		
Carolyn Harshman	Emergency Planning Consultants	President

## Acknowledgements

### City of Clayton

- ✓ Carl Wolfe, Mayor
- ✓ Peter Cloven, Vice Mayor
- ✓ Jim Diaz, Council Member
- ✓ Holly Tillman, Council Member
- ✓ Jeff Wan, Council Member

<b>ELEMENT A: PLANNING PROCESS   A1</b>
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))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A1c.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Point of Contact</b> below.

## Point of Contact

To request information or provide comments regarding this mitigation plan, please contact:

<b>Name &amp; Position Title</b>	Reina Schwartz, City Manager
<b>Email</b>	rschwartz@ci.clayton.ca.us
<b>Mailing Address</b>	6000 Heritage Trail, Clayton, CA 94517
<b>Telephone Number</b>	(925) 673-7300

## Consulting Services

### *Emergency Planning Consultants*

- ✓ Principal Planner: Carolyn J. Harshman, CEM
- ✓ Planning Assistant: Megan R. Fritzler

3665 Ethan Allen Avenue  
 San Diego, California 92117  
 Phone: 858-483-4626  
 epc@pacbell.net  
 www.carolynharshman.com

## Mapping

The maps in this plan were provided by the City of Clayton, Contra Costa County, 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 Clayton 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\***

<b>ELEMENT A: PLANNING PROCESS   A1</b>
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))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A1a.</b>
<b>Q:</b> Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan's development as well as who was involved.)
<b>A:</b> See <b>Plan Methodology and Planning Phases Progression</b> below.

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# Part I: PLANNING PROCESS

## Introduction

### ELEMENT A: PLANNING PROCESS | A1

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))

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

The Hazard Mitigation Plan (Mitigation Plan) was prepared in response to the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) requires state and local governments (including special districts and joint powers authorities) 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 of Clayton emergency management planning programs. This Hazard Mitigation Plan is an update to the Clayton Annex of the 2011 Association of Bay Area Governments (ABAG) Multi-Jurisdictional Hazard Mitigation Plan. FEMA mandates 5-year updates in order to be eligible for Hazard Mitigation Grant Program funding. Since this plan exceeds the 5-year standard, FEMA will consider it a “new” plan.

### 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 **Planning Approach** below.

## 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.
- ✓ **Prepare implementation strategy** - Generally, high priority activities are recommended for implementation first. However, based on organizational 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.

**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 **National Flood Insurance Program** and **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 City of Clayton participates in NFIP and the FEMA FIRM maps for the City of Clayton were last updated on March 21, 2017. These studies and maps represent flood risk at the point in time when FEMA completed the studies and does not incorporate planning for floodplain changes in the future due to new development. Although FEMA is considering changing that policy, it is optional for local communities. The City of Clayton is located within a 100-year and a 500-year floodplain. The City Engineer serves as the floodplain administrator.

**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, within the City’s boundaries there are no Repetitive Loss Properties (RLP).

**ELEMENT A: PLANNING PROCESS | A1**

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))

**Q&A | ELEMENT A: PLANNING PROCESS | A1b.**

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

**A:** See **Planning Process** below.

# Planning Process

Throughout the project, the Planning Team served as the primary stakeholders while also making a concerted effort to gather information from the general public, internal departments, external agencies (surrounding jurisdictions, utility providers, special districts, etc.). In addition, the Planning Team solicited information from agencies and people with specific knowledge of hazards and past historical events, as well as building codes and facilities maintenance planning. The hazard mitigation strategies contained in this plan were developed through an extensive planning process involving City of Clayton’s staff, general public, and external agencies.

Following review and input by the Planning Team to the First Draft Plan, next (still during the Plan Writing Phase), the Second Draft Plan was shared with the general public, internal departments, and external agencies (joint powers authority jurisdictions, utility providers, special districts, etc.). The general public, internal departments, 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 along with a request for a determination of “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 then posted in advance of the City Council meeting. Any comments gathered were included in the staff report to the City Council. Following adoption by the City Council, proof of adoption was forwarded to FEMA with a request for approval. The FEMA Letter of Approval was included in the Final Plan. The planning process described above is portrayed below in the Planning Phases Progression:

<b>ELEMENT A: PLANNING PROCESS   A1</b>
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))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A1a.</b>
<b>Q:</b> Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan’s development as well as who was involved.)
<b>A:</b> See <b>Planning Phases Progression</b> below.

<b>ELEMENT A: PLANNING PROCESS   A3</b>
Does the plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A3a.</b>
<b>Q:</b> Does the plan document how the public was given the opportunity to be involved in the planning process? (Requirement §201.6(b)(1))
<b>A:</b> See <b>Planning Phases Progression</b> below.

<b>ELEMENT A: PLANNING PROCESS   A6</b>
Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6a.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>monitored</b> (how will implementation be tracked) over time? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Planning Phases Progression</b> below.

**Figure: Planning Phases Progression**

PLANNING PHASES PROGRESSION				
Plan Writing Phase (First & Second Draft Plan)	Plan Review Phase (Third Draft Plan)	Plan Adoption Phase (Final Draft Plan)	Plan Approval Phase (Final Plan)	Plan Implementation Phase
<ul style="list-style-type: none"> <li>• Planning Team input – research, meetings, writing, review of First Draft Plan</li> <li>• Incorporate input from the Planning Team into Second Draft Plan</li> <li>• Invite public and external agencies via email and web posting to review, comment, and contribute to the Second Draft Plan</li> <li>• Incorporate input into the Third Draft Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Third Draft Plan sent to Cal OES and FEMA for approval pending adoption</li> <li>• Address any mandated revisions identified by Cal OES and FEMA into Final Draft Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Post public notice of City Council meeting along with the Final Draft Plan</li> <li>• Final Draft Plan distributed to City Council in advance of meeting</li> <li>• Present Final Draft Plan to the City Council for adoption</li> <li>• City Council adopts Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Submit Proof of Adoption to FEMA with request for final approval</li> <li>• Receive FEMA Letter of Approval</li> <li>• Incorporate FEMA approval and City Council resolution into the Final Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct annual Planning Team meetings</li> <li>• Integrate mitigation action items into budget and other funding and strategic documents</li> </ul>



## Plan Adoption Process

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

The Third Draft Plan was submitted to Cal OES and FEMA for review and approval. FEMA issued an Approval Pending Adoption on [redacted] requiring the adoption of the Plan by the City Council. The adoption resolution was submitted to FEMA along with a request for a FEMA Letter of Approval.

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 to adopt the hazard mitigation plan. The Resolution of adoption is located in the **Attachments: City Council Resolution**.

## Plan Approval

FEMA approved the Plan on [REDACTED]. A copy of the FEMA Letter of Approval is in the **Attachments: FEMA Letter of Approval**.

### ELEMENT A: PLANNING PROCESS | A1

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))

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

**Q:** Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan’s development as well as who was involved.)

**A:** See **Plan Methodology** below.

## Plan Methodology

The Planning Team discussed knowledge of hazards and past historical events, as well as building codes and facilities maintenance plans.

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

### ELEMENT A: PLANNING PROCESS | A1

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))

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

**Q:** Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan’s development as well as who was involved.)

**A:** See **Planning Team Involvement** below.

## Planning Team Involvement

The Planning Team consisted of representatives from City departments with a role in hazard mitigation processes. The Planning Team served as the primary stakeholders throughout the planning process. The general public and 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
- ✓ Update status of Mitigation Action Items
- ✓ Develop new Mitigation Action Items
- ✓ Participate in Planning Team meetings and City Council public meeting
- ✓ Provide existing resources including maps and data

The Planning Team, with assistance from Emergency Planning Consultants, identified and profiled hazards; determined hazard rankings; estimated potential exposure or losses; evaluated development trends and specific risks; and developed mitigation goals and action items.

<b>ELEMENT A: PLANNING PROCESS   A1</b>
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))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A1a.</b>
<b>Q:</b> Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan’s development as well as who was involved.)
<b>A:</b> See <b>Planning Team Level of Participation</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A1b.</b>
<b>Q:</b> Does the plan list the jurisdiction(s) participating in the plan that are seeking approval? (Requirement §201.6(c)(1))
<b>A:</b> See <b>Planning Team Level of Participation</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A1c.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Planning Team Level of Participation</b> below.

**Table: Planning Team Level of Participation**

Name	Risk Assessment	Plan Research and Writing	Planning Team Meeting 1: January 4, 2021	Planning Team Meeting 2: January 11, 2021	Planning Team Meeting 3: January 19, 2021	Planning Team Meeting 4: January 25, 2021	Planning Team Meeting 5: February 12, 2021	Community Input - Distribute Second Draft Plan to Public, Internal Departments, and External Agencies	Incorporate input from Public, Internal, and External Agencies into the Third Draft Plan	Submit Third Draft Plan to Cal OES/FEMA for Approval Pending Adoption	Receive FEMA Approval Pending Adoption	Post Final Draft Plan in Advance of City Council Meeting	Present Final Draft Plan to City Council or Plan Adoption	Submit Proof of Adoption to FEMA for Final Approval	Receive FEMA Final Approval and Incorporate FEMA Approval into Final Plan
<b>City of Clayton</b>															
Reina Schwartz, Chair	X	X	X	X	X	X	X	X							
Laura Hoffmeister	X														
Scott Alman	X	X	X	X	X	X	X								
Matthew Feske	X	X	X	X	X	X	X								
Bill Stracker	X														
<b>Emergency Planning Consultants</b>															
Carolyn Harshman	X	X	X	X	X	X	X		X	X					
Megan Fritzer	X	X													

**ELEMENT A: PLANNING PROCESS | A1**

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))

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

**Q:** Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan’s development as well as who was involved.)

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

**Table: Planning Team Timeline**

Task	December 2020	January 2021	February	March	April	May	June	July	August	September	October	November	December	January 2022
<b>Research</b>														
Research for Risk Assessment	X													
Prepare HAZUS	X													
<b>Plan Writing</b>														
First, Second, Third, and Final Drafts, Final Plan	X	X	X	X	X	X	X	X	X	X	X			
<b>Planning Team Meetings</b>														
Meeting #1 LHMP Overview and Initial Hazard Briefing		X												
Meeting #2 Best Practices and Plan Integration		X												
Meeting #3 HAZUS and Mitigation Action Items		X												
Meeting #4 Mitigation Action Items		X												
Meeting #5 Review First Draft Plan			X											
<b>Community Outreach</b>														
Encouraging Public Participation in Mitigation Activities						X								
General Public, Internal Departments, and External Agencies Input to Present Second Draft Plan						X								
<b>Adoption and Approval of Plan</b>														
Submit Third Draft Plan to Cal OES/FEMA. Complete Mandated Revisions.									X	X	X			
Receive FEMA's Approval Pending Adoption														
Post and Conduct City Council Meeting to Adopt the Final Draft Plan and submit Proof of Adoption to FEMA														
Receive FEMA Final Approval														

<b>ELEMENT A: PLANNING PROCESS   A2</b>
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 interests to be involved in the planning process? (Requirement §201.6(b)(2))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A2a.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Secondary Stakeholders</b> and <b>Secondary Stakeholders Involvement</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A2b.</b>
<b>Q:</b> Does the plan identify how the stakeholders were invited to participate in the process? (Requirement §201.6(b)(2))
<b>A:</b> See <b>Secondary Stakeholders</b> and <b>External Agencies Letter of Invitation</b> below.

<b>ELEMENT A: PLANNING PROCESS   A3</b>
Does the plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A3a.</b>
<b>Q:</b> Does the plan document how the public was given the opportunity to be involved in the planning process? (Requirement §201.6(b)(1))
<b>A:</b> See <b>Secondary Stakeholders</b> and <b>Secondary Stakeholders Involvement</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A3b.</b>
<b>Q:</b> Does the plan document how the public’s feedback was incorporated into the plan? (Requirement §201.6(b)(1))
<b>A:</b> See <b>Secondary Stakeholders</b> and <b>Secondary Stakeholders Involvement</b> below.

## Secondary Stakeholders

In addition to the Planning Team, the secondary stakeholders also provided information, expertise, and other resources during plan writing phase. The secondary stakeholders included the City staff, general public, internal departments, and external agencies. All gathered input was incorporated into the Third Draft Plan prior to distribution to Cal OES and FEMA. For a specific accounting of the date, source, information gathered, and use of information during the Plan Writing Phase, please see below: **Secondary Stakeholder Involvement**. Input was gathered from internal departments and external agencies however no input was received from the general public or the City staff.

In advance of the City Council public meeting, City staff, general public (via Robocall), internal departments, and external agencies (via email) were informed of the Final Draft Plan and encouraged to participate in the public meeting. Any comments gathered were noted in the Planning Team Staff Report and added to the Final Plan.

The Hazard Mitigation Planning Team (Planning Team) consisting of City staff worked with Emergency Planning Consultants to create the hazard mitigation plan. **The Planning Team served as the primary stakeholders throughout the planning process.**

As required by DMA 2000, the Planning Team involved “the public”. The general public, internal departments, and external agencies were invited to contribute to the mitigation plan during the plan writing phase. Emails were distributed to City staff, internal departments, and external agencies on May 1, 2021, containing a link to the Second Draft Plan’s web posting. The emails requested comments back by May 24, 2021. See **External Agencies Letter of Invitation** below for the sample email.

***The general public, internal departments, and external agencies served as secondary stakeholders with opportunity to contribute to the plan during the Plan Writing Phase of the planning process.***

## Secondary Stakeholders Involvement

Date Invited to Provide Input or Input Gathered	Name, Position Title, Agency Represented	Information Gathered and Utilized
<b>External Agencies</b>		
May 1, 2021	Christopher Lim, Executive Director, Contra Costa Resource Conservation District	
May 1, 2021	Barbara Riveira, Contra Costa County Administrator’s Office	
May 1, 2021	Anthony Macias, Employment and Human Services Department, Contra Costa County	
May 1, 2021	Kristin Sherk, Senior Planner, Contra Costa County Department of Conservation and Development	
May 1, 2021	Matthew Slattengren, Ag Commissioner/Weights & Measures Director, Contra Costa County Agriculture/Weights & Measures	
May 1, 2021	Jamar Stamps, Principal Planner, Transportation Planning, Contra Costa County	
May 1, 2021	Fatima Matal Sol, Alcohol & Other Drugs Advisory Board, Contra Costa County Health Services	
May 1, 2021	Jami Morrith, Chief Assistant Clerk of the Board, Contra Costa County Board of Supervisors	
May 1, 2021	Judith Evans, Properties – Maintenance & Management, Contra Costa County Airports	
May 1, 2021	Natalie Olesen, Finance Director, Contra Costa County Airports	
May 1, 2021	Nicole Popczuk, Office of Reentry & Justice, Department of Probation	
May 1, 2021	Deborah Cooper, County Clerk-Recorder	
May 1, 2021	Paul Reyes, Senior Deputy County Administrator, Contra Costa County	
May 1, 2021	Jaime Jenett, Continuum of Care Planning and Policy Manager, Health, Housing & Homeless Services, Contra Costa Health Services	
May 1, 2021	Julie Enea, Senior Deputy County Administrator, Contra Costa County	
May 1, 2021	LaTonia Ellingberg, Recording Secretary, Contra Costa County Fire Protection District Advisory Fire Commission	
May 1, 2021	Jerry Fahy, Transportation Engineer, Contra Costa County Department of Public Works	

Date Invited to Provide Input or Input Gathered	Name, Position Title, Agency Represented	Information Gathered and Utilized
May 1, 2021	Maureen Toms, Deputy Director, Policy Planning, Contra Costa County Department of Conservation and Development	
May 1, 2021	Vi Ibarra, Contra Costa County Health Services, Developmental Disability Council	
May 1, 2021	Eric Pfuehler, Chief of Government & Legislative Affairs, East Bay Regional Parks District	
May 1, 2021	Rachel Morris, Administrative Services Assistant III, EMS, Contra Costa County Health Services	
May 1, 2021	Antoine Wilson, Equal Opportunity Officer, Contra Costa County	
May 1, 2021	Dr. Ruth Fernandez, Executive Director, First 5 of Contra Costa County	
May 1, 2021	Alex Khu, Executive Assistant, Contra Costa County First Five	
May 1, 2021	Maureen Parkes, Contracts, East Contra Costa County Habitat Conservancy	
May 1, 2021	Michael Kent, Hazardous Materials Commission Executive Assistant	
May 1, 2021	Doninique Vogelpohl, Project Planner, Contra Costa County Department of Conservation and Development	
May 1, 2021	Joseph Villarreal, Executive Director, Contra Costa Housing Authority	
May 1, 2021	Wade Finlinson, Coordinator, Contra Costa Health Services	
May 1, 2021	Carl Roner, Senior Civil Engineer, Contra Costa County Public Works	
May 1, 2021	Executive Secretary, Probation Administration, Contra Costa County	
May 1, 2021	Walter Beveridge, Executive Secretary, Contra Costa County Library	
May 1, 2021	Roberto Rodriguez, Supervisor, Plan Review; Contra Costa County Environmental Health Division	
May 1, 2021	Denise Clarke, Youth Development Services Supervisor	
May 1, 2021	Angela Beck, Senior Clerk Support, Contra Costa Health Services	
May 1, 2021	Paul Macedo, General Manager, Contra Costa Mosquito & Vector Control District	
May 1, 2021	Hiliana Li, Planner, Contra Costa County Conservation and Development Department	
May 1, 2021	Carey Rowan, Director of Library Services, Contra Costa County Law Library	
May 1, 2021	Colin Piethe, Transportation Planner, Contra Costa County Department of Conservation and Development	
May 1, 2021	Patty Pell, Office Administrator, Contra Costa Resource Conservation District	
May 1, 2021	Jody London, Sustainability Coordinator, Contra Costa County	
May 1, 2021	Ronda Boler, Executive Assistant, Contra Costa County Treasurer-Tax Collector	
May 1, 2021	Monica Nino, County Executive, Contra Costa County	

Date Invited to Provide Input or Input Gathered	Name, Position Title, Agency Represented	Information Gathered and Utilized
May 1, 2021	Stacey Durocher, Executive Secretary, Contra Costa County Human Resources Department	
May 1, 2021	Broschard, Lewis, Contra Costa Fire Protection District, Fire Chief	
May 1, 2021	Cameron Morrison, Supervising Park Ranger, Mt. Diablo State Park	
May 1, 2021	Eddie Guaracha, Diablo Range District Superintendent, CA State Parks	
May 1, 2021	Frank Gavidia, Planning Commissioner	
May 1, 2021	AJ Chippero, Planning Commissioner	
May 1, 2021	Terri Denslow, Planning Commissioner	
May 1, 2021	Ed Miller, Clayton Planning Commissioner	
May 1, 2021	Bassam Altwal, Planning Commissioner	
May 1, 2021	Rochelle Soriano, Administrative Secretary to the Executive Director of the Workforce Development Board of Contra Costa County	
May 1, 2021	Beatriz Salgado, IHSS Public Authority Staff	
May 1, 2021	Elizabeth Dondi, Executive Director, Contra Costa County IHSS Public Authority	
May 1, 2021	Kendall Morrison, Contra Costa County Managed Care Commission	
May 1, 2021	Robert Sarmiento, Planner, Department of Conservation and Development, Contra Costa County	
May 1, 2021	Jay Hasan, Aviation Advisory Committee, Contra Costa County Airports	
May 1, 2021	Nancy Sparks, Comprehensive Services Manager/CSBG Program Manager, Employment and Human Services Department, Contra Costa County	
May 1, 2021	Laura Malone, Family and Children's Trust (FACT) Staff, Contra Costa County Employment and Human Services Department	
May 1, 2021	Ruby Horta, Planning Director, County Connection	
May 1, 2021	Central Contra Costa Sanitary District	
May 1, 2021	Arts & Culture Commission of Contra Costa County	
<b>General Public</b>		
May 1, 2021	William Claney	Mistook the Mitigation Plan for an Emergency Operations Plan so wanted to know where to find the response protocols and procedures. City sent an email response clarifying the purpose of the HMP and that the EOP is in the process of being updated.

**ELEMENT A: PLANNING PROCESS | A2**

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 interests to be involved in the planning process? (Requirement §201.6(b)(2))

**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 **External Agencies Letter of Invitation** below.

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

**Q:** Does the plan identify how the stakeholders were invited to participate in the process? (Requirement §201.6(b)(2))

**A:** See **External Agencies Letter of Invitation** below.

## External Agencies Letter of Invitation

Subject: Local Hazard Mitigation Plan

Hello,

The City of Clayton is in the process of updating its Local Hazard Mitigation Plan (LHMP). The LHMP identifies the natural risks and human-caused hazards within our community. The Plan also provides a list of mitigation action items that can be used to reduce the impacts from these hazards.

Part of the mandated approval process for the LHMP requires the City to share this document with key organizations within the community and solicit comments during the plan writing phase.

I am asking you to please review this draft version of the LHMP (attached or available on the City's website here: <https://ci.clayton.ca.us/2021/05/10/20018/>) and share your comments with me by Monday May 24th. This information is important to our community's future and I hope you will be able to find the time to assist me with this task. If for some reason this has reached you in error, I apologize for the intrusion.

Thank you in advance for your time and assistance with this project. I look forward to reading your comments.

Reina J. Schwartz, City Manager

City of Clayton | 6000 Heritage Trail | Clayton, CA 94517

Tel: (925) 673-7300 | Direct: (925) 673-7313 | Fax: (925) 672-4917

E-Mail: [rschwartz@ci.clayton.ca.us](mailto:rschwartz@ci.clayton.ca.us)

<b>ELEMENT C: MITIGATION STRATEGY   C1</b>
Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C1a.</b>
<b>Q:</b> Does the plan document each jurisdiction’s existing authorities, policies, programs and resources? (Requirement §201.6(c)(3))
<b>A:</b> See <b>Capability Assessment – Existing Processes and Programs</b> below.
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C1b.</b>
<b>Q:</b> Does the plan document each jurisdiction’s ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))
<b>A:</b> See <b>Capability Assessment – Existing Processes and Programs</b> below.

<b>ELEMENT C: MITIGATION STRATEGY   C5</b>
Does the plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C5b.</b>
<b>Q:</b> Does the plan identify the position, office, department, or agency responsible for implementing and administering the action, potential funding sources and expected timeframes for completion? (Requirement §201.6(c)(3))
<b>A:</b> See <b>Capability Assessment – Existing Processes and Programs</b> 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 the City’s operational guidelines. FEMA identifies four types of capabilities:

- ✓ Planning and Regulatory
- ✓ Administrative and Technical
- ✓ Financial
- ✓ Education and Outreach

The table below includes a broad range of capabilities within the City to successfully accomplish mitigation.

**Table: Capability Assessment - Existing Processes and Programs**  
 (Source: City of Clayton Website, 2021)

Type of Capability				Name of Capability	Capability Description and Ability to Support Mitigation
Planning & Regulatory	Administrative & Technical	Financial	Education & Outreach		
<b>City of Clayton Departments</b>					
	X	X	X	Administration	The City Administration Department is responsible for facilitating, coordinating, and supervising the work of all departments to ensure policies set by the City Council are being implemented successfully and consistently. Facilitating communication with the City Council, the City's professional staff, and the community is a key function of this department as well as the emphasis to all departments on the provision of hallmark customer service to Clayton residents and the public to maintain Clayton's distinction as a premier small city.
X	X	X	X	Community Development	The City of Clayton's Community Development Department is responsible for implementing the City's policies as it pertains to the development of the community, while also protecting and maintaining the quality of its physical environment. The Community Development Department strives to provide exemplary customer service to the community in order to distinguish Clayton as a premier small city.
	X	X		Finance	The Finance Department oversees various essential business services of the City including budgeting, accounting, cash management, business licenses, and facility and park rentals. The department consists of four divisions: Business Services, Budgeting, Accounting and Financial Reporting, and Treasury and Investments
X	X	X	X	Engineering	Clayton's Engineering Department provides support to the various City departments, implements the City's Capital Improvement Program, administers and enforces the City's Stormwater Management Program, administers the Geological Hazard Abatement District and various Assessment Districts, and performs engineering review for all private development projects.
	X		X	Police	The Clayton Police are committed to working with the community in a collaborative effort to reduce crime, increase traffic safety and address quality of life issues. Our Officers serve the residents and visitors of Clayton with respect and professionalism and always do their best to provide for the needs of their citizens.
	X		X	Human Resources	The Human Resources Department is responsible for employee recruitment and selection, job classification and compensation, benefits administration, and workforce training and development. The Human Resources Department is also responsible for the City's Risk Management programs and activities, including workers' compensation, liability and subrogation, safety programs, and insurance.
	X		X	Maintenance Services	The Clayton Maintenance Department oversees the maintenance and upkeep of the City's parks, open space, trails, buildings, streets, and landscaping. The Department has six full time employees and uses part-time seasonal workers to help maintain the City. The Department maintains approximately:

Type of Capability				Name of Capability	Capability Description and Ability to Support Mitigation
Planning & Regulatory	Administrative & Technical	Financial	Education & Outreach		
					<ul style="list-style-type: none"> <li>• 35 acres of landscaping</li> <li>• 14 acres of parks</li> <li>• 80,000 square feet of public buildings</li> <li>• 1,000 streetlights</li> <li>• over 1,000 street signs</li> <li>• 84 miles of streets and markings</li> <li>• 575 catch basins</li> <li>• 515 acres of open space with 27 miles of trails</li> <li>• 10 miles of v-ditches and</li> <li>• 10 miles of creeks</li> </ul>
	X			City Attorney	The City Attorney serves as legal advisor to the full City Council, the City's commissions, and the City's professional staff and is responsible for managing all legal matters for the City. The City Attorney is appointed and serves at the pleasure of the City Council.
X	X	X	X	City Manager	As a general law municipality, Clayton is organized by a Council-Manager form of government, where the City Manager functions as the chief executive officer of the City. Appointed by the City Council, the City Manager serves at the will and pleasure of the City Council and receives policy direction from the City Council during public meetings. The City Manager is responsible for ensuring all laws and ordinances adopted by the City Council are properly implemented and enforced. Each Department Head of the City is hired by and supervised by the City Manager; together they form the team ultimately accountable for administering the day-to-day operations of the City's services to its community.
	X		X	City Clerk	The City Clerk's Office is responsible for the preparation of agendas and minutes; compliance with legal noticing requirements; responding to requests for public records; maintenance of the City's Municipal Code; management of the citywide records management program; and serves as the Elections Official for the conduct of general and special elections.
	X	X		Treasurer	<p>The City Council of the City of Clayton appoints a City Treasurer to help administer the financial and investment affairs of the City efficiently, economically, and harmoniously. The City Treasurer is appointed wholly on the basis of such person's abilities and qualifications serving an indefinite term, at the pleasure of the City Council.</p> <p>Powers and Duties</p> <ul style="list-style-type: none"> <li>• Auditing the City's financial records and transactions.</li> <li>• Reviewing and evaluating finance documents for accuracy and compliance with the principles of the Government Accounting Standards Board.</li> <li>• Providing signature for payments made in the absence of the City Clerk.</li> </ul>

Type of Capability				Name of Capability	Capability Description and Ability to Support Mitigation
Planning & Regulatory	Administrative & Technical	Financial	Education & Outreach		
					<ul style="list-style-type: none"> <li>• Providing signature on related Finance Department records that require approval by the City Treasurer.</li> <li>• Working with the City Manager and Finance Manager to oversee and manage the City's investment practices; audits the City's cash position, and audits bank reconciliations.</li> <li>• Attending City meetings when necessary to discuss and/or explain finance related issues.</li> </ul>
X	X	X	X	City Council	The City Council is the elected policy-making body for the City of Clayton. It is comprised of five members elected at-large who serve four-year overlapping terms. The Mayor is selected annually by the City Council from among its members. The City Council serves as the Board of Directors for the Successor Agency for the Clayton Redevelopment Agency, the Clayton Financing Authority and the Geological Hazard Abatement District. Council members represent the City on the governing boards of numerous Joint Powers Authorities.
X	X	X	X	Planning	<p>The Planning Division is responsible for the implementation and the administration of the City's policies that direct the physical development of Clayton. All development and land use projects are analyzed for compliance with the City's policies, which are contained in the General Plan, Specific Plans, and the Clayton Municipal Code. The Planning Division oversees both current and long ranging planning projects.</p> <p>The staff within the Planning Division assists the public with questions related to home improvements, design, zoning designations, setback requirements, and provides guidance navigating the permitting process. For additional information on permit requirements and processes, see the City's Permit Center.</p>
X	X		X	Parks and Recreation	The Parks and Recreation Department works with City staff in matters pertaining to parks, recreation areas, facilities, programs, and other associated activities, and cooperates with other governmental agencies and civic groups in the advancement of sound park and recreation planning and programming.
<b>City of Clayton Programs</b>					
			X	CERT	The Community Emergency Response Team (CERT), established in 2007, provided Clayton with the opportunity to be prepared and to institute a formal structure in the event of an emergency. There is a City of Clayton Citizen Corp Council which coordinates the activities of CERT for Clayton. The City of Clayton is a member of the Contra Costa Cities Citizen Corp/CERT Committee. This group works with the Office of Emergency Services in obtaining funds and training personnel in conducting the activities of the members of the group.

Type of Capability				Name of Capability	Capability Description and Ability to Support Mitigation
Planning & Regulatory	Administrative & Technical	Financial	Education & Outreach		
<b>City of Clayton Funding Programs</b>					
X	X	X	X	Capital Improvements Plan	The City's Capital Improvement Program (CIP) is a long-term plan which articulates, identifies, and prioritizes both large and expensive projects focusing on infrastructure improvements, equipment purchases, and facilities improvements as well as annual and day-to-day maintenance and repair of the City's infrastructure. The plan is executed by the City Council in rolling five-year increments based on long-term needs of the City balanced with available funding sources necessary to meet those needs.
X	X	X	X	Annual Adopted Budgets	The City's fiscal year runs from July 1st through June 30th. Each year, the Finance Manager, under direction from the City Manager, compiles an annual operating budget for the City. The adopted operating budget also incorporates the City's 5-year Capital Improvement Program (CIP) budget, which is prepared by the City Engineer. The current Adopted Budget is the 2020-2021 Budget.
<b>External Policies and Plans</b>					
X			X	Alameda County Resource Conservation District and Contra Costa Resource Conservation District Regional Priority Plan	The Plan's goals are to: + Enhance the health and protection of natural resources, wildlife, as well as regional public safety + Promote and support collaborative planning and implementation, including extensive grazing management programs + Coordinate and integrate management of wildfire resiliency at the regional scale+ Identify and prioritize forestry/wildland and wildfire protection projects

**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.

**ELEMENT C: MITIGATION STRATEGY | C1**

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

**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 **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 Clayton Website**

<https://ci.clayton.ca.us/>

*Applicable Incorporation: Board Members, Maps, Location and the Environment, City Profile, Capabilities Assessment.*

### **Contra Costa Local Hazard Mitigation Plan Draft, Volume 1 (2018)**

<https://www.contracosta.ca.gov/DocumentCenter/View/48893/Contra-Costa-County-Draft-Local-Hazard-Mitigation-Plan-Volume-1-January-31-2018?bidId=>

*Applicable Incorporation: Maps, Location and the Environment, Chapter Information.*

### **Contra Costa Local Hazard Mitigation Plan Draft, Volume 2 (2018)**

<https://www.contracosta.ca.gov/DocumentCenter/View/48894/Contra-Costa-County-Draft-Local-Hazard-Mitigation-Plan-Volume-2-January-31-2018?bidId=>

*Applicable Incorporation: Maps, Location and the Environment, Chapter Information.*

### **The Association of Bay Area Governments Hazard Mitigation Plan (2011)**

<https://abag.ca.gov/2011-bay-area-hazard-mitigation-plan>

*Applicable Incorporation: City Profile, Climate, Local Conditions*

### **California’s Fourth Climate Change Assessment: San Francisco Bay Area Region Report (2019)**

[https://www.energy.ca.gov/sites/default/files/2019-11/Reg\\_Report-SUM-CCCA4-2018-005\\_SanFranciscoBayArea\\_ADA.pdf](https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-005_SanFranciscoBayArea_ADA.pdf)

*Applicable Incorporation: Impacts of Climate Change to Hazards*

### **State of California Hazard Mitigation Plan (2018)**

[www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/state-hazard-mitigation-plan](http://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/state-hazard-mitigation-plan)

*Applicable Incorporation: Used to identify hazards posing greatest threat to State*

### **HAZUS Maps and Reports**

Created by Emergency Planning Consultants

*Applicable Incorporation: Numerous HAZUS maps and reports have been included for Earthquake and Flooding to determine specific risks and impacts to the City*

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

[www.fema.gov/media](http://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](http://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**

<https://msc.fema.gov/portal/home>

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

**California Department of Forestry and Fire Protection (CAL FIRE)**

[www.fire.ca.gov](http://www.fire.ca.gov)

*Applicable Incorporation: Wildland fire hazard mapping*

**California Department of Conservation**

[www.conservation.ca.gov/cgs](http://www.conservation.ca.gov/cgs)

*Applicable Incorporation: Seismic hazards mapping*

**U.S. Geological Survey (USGS)**

[www.usgs.gov](http://www.usgs.gov)

*Applicable Incorporation: Earthquake records and statistics*

**Using HAZUS for Mitigation Planning (2018)**

[https://www.fema.gov/sites/default/files/documents/fema\\_using-hazus-mitigation-planning\\_2018.pdf](https://www.fema.gov/sites/default/files/documents/fema_using-hazus-mitigation-planning_2018.pdf)

*Applicable Incorporation: HAZUS Information*

**NOAA National Centers for Environmental Information, Storms Database (2021)**

<https://www.ncdc.noaa.gov/cag/county/time-series>

*Applicable Incorporation: Previous hazard occurrences*

## Part II: RISK ASSESSMENT

### City Profile

#### Q&A | ELEMENT B3:

**Q:** Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(b)(3))

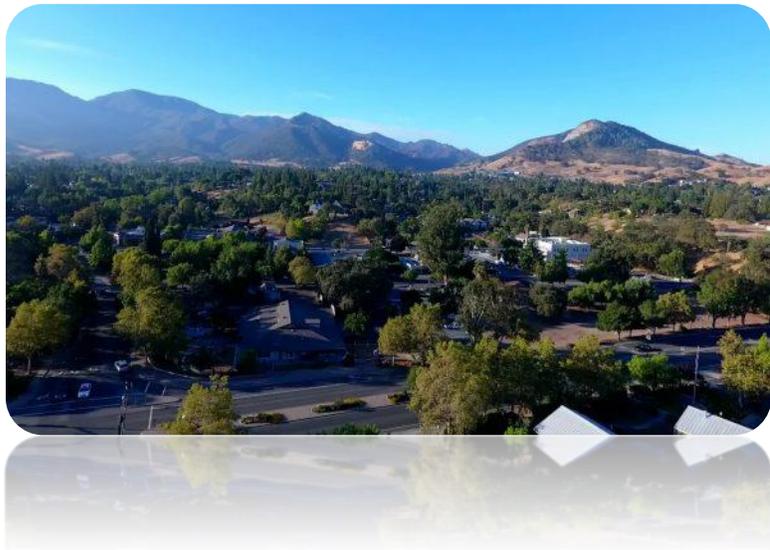
**A:** See **Location and the Environment** below.

#### Location and the Environment

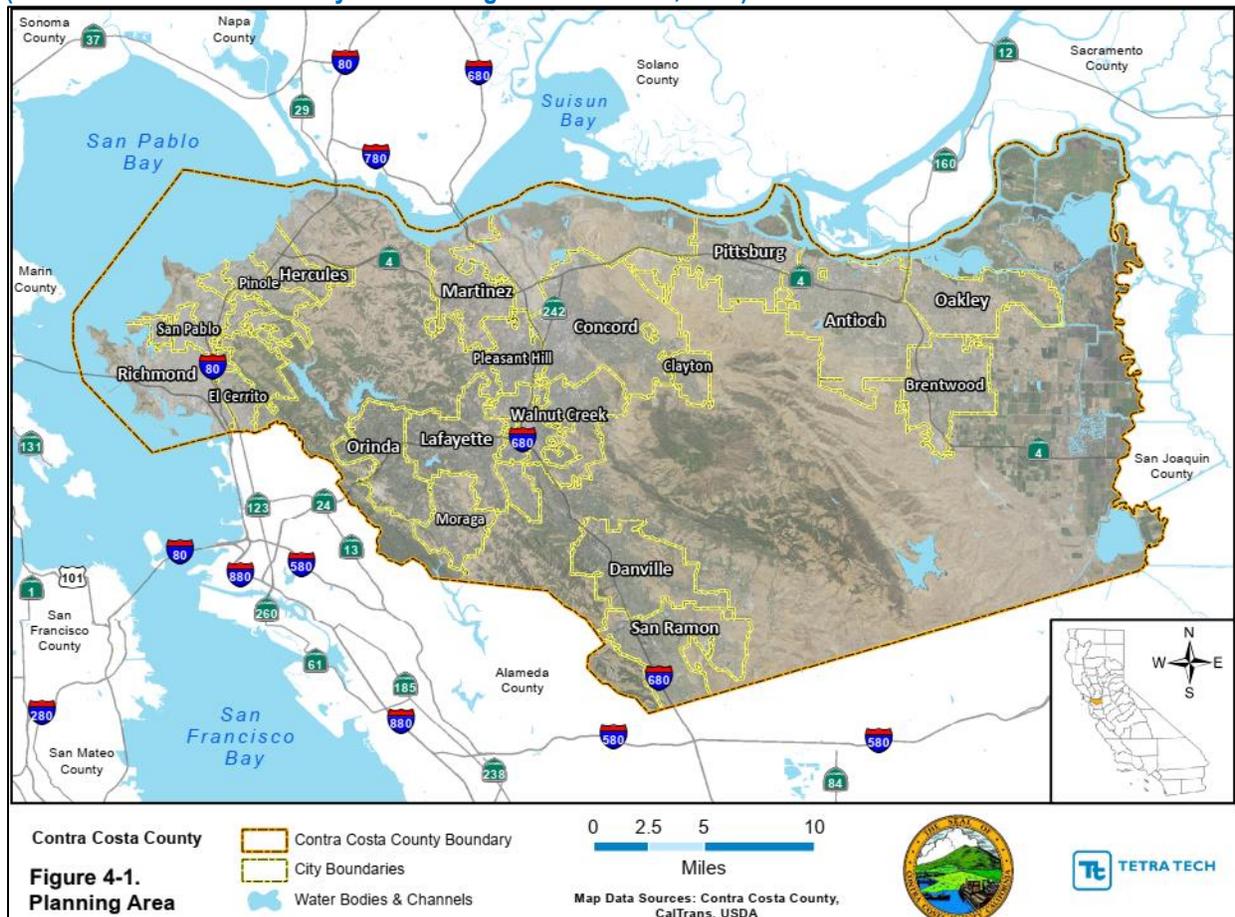
The City of Clayton is bordered on the north-west and west by unincorporated Contra Costa County land and Black Diamond Mines Regional Park; on the south by unincorporated Contra Costa County land and Mt. Diablo State Park; and to the east and north by City of Concord.

City of Clayton is a small, rural-urban, 100% 'dry-land' community surrounded by much larger, urban cities. Clayton is the smallest city in Contra Costa County.

Today, Clayton has 27 miles of walking trails covering some 515 acres of open space. The city has been listed among Money magazine's "100 Best Places to Live" three (3) times since 2011.



**Map: Regional Map - Contra Costa County**  
 (Source: Contra Costa County Hazard Mitigation Plan Draft, 2018)



## Climate

According to the Clayton General Plan (2000), the City of Clayton enjoys one of the most desirable climates on the planet. It is described per the Köppen-Geiger Classification System as ‘Csb’ – defined as a “Warm-summer - Mediterranean” designation. Csb is found in the Mediterranean itself; a few locations in Latin America; and a narrow coastal strip on the U.S. and Canadian West Coast, extending from Central California to Victoria, British Columbia.

Cool-to-cold - short winters; a nearly frost free spring; a long, sunny growing season that tends to be warm, rather than hot; and favorable temperature fluctuations between night and day, describe Csb climate characteristics. During the hot season months of June through September, temperatures tend to run from lows in the mid-60 degrees Fahrenheit to mid-to-high 80’s. Winter season runs from about November through February, with an average temperature range of high 30s to mid-60s. Neighbor city – Concord is described by the National Weather Service as a *hot* summer Mediterranean climate. The difference in Clayton’s *warm* summer Mediterranean climate designation appears to be the city’s sheltered location in the valley north of Mt. Diablo.

The majority of rainfall occurs between October and May. Analysis of long-term, regional precipitation records indicate a pattern of wetter-than-average and drier-than-normative cycles,

often lasting several years, are common in the region. Severe, damaging rainstorms occur in the Bay Area at a frequency of about once every three years. The Western United States periodically experiences two distinct weather patterns that can cause severe storms and heavy precipitation. The two weather patterns are:

**El Nino**—A warm ocean current that typically appears around late December and lasts for several months but may persist into May or June. The warm current influences storm patterns around the globe. As a result, these climate events commonly bring heavy rains and blustery storms and, in some locations, drought. During the past 40 years, nine El Nino events have affected the western coasts of North and South America.

**Pineapple Express**—A Pacific Ocean subtropical jet stream that brings warm moist air from Hawaii into the region. The combination of moisture-laden air, atmospheric dynamics and orographic enhancement that results as this air passes over the mountain ranges of the West Coast cause some of the region's most torrential rains. Pineapple Express is a common term for the torrential rains that often characterize these 'atmospheric rivers' (see **Flood Hazards**).

## Changes in Development

According to the Planning Team, only routine in-fill projects have been completed since the 2011 Clayton Annex was prepared. Also, no General Plan amendments or increases in zoning have taken place during that time. Therefore, it was determined that there have been no changes in vulnerability to hazards based on construction of buildings or infrastructure.

# 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:

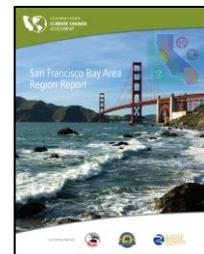
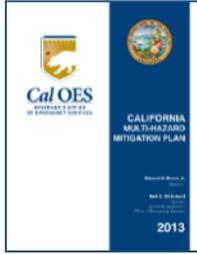
1. *Hazard Identification*
2. *Profiling Hazard Events*
3. *Vulnerability Assessment/Inventory of Existing Assets*
4. *Risk Analysis*
5. *Assessing Vulnerability/Analyzing Development Trends*

<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1</b>
Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1a.</b>
<b>Q:</b> Does the plan include a general <b>description</b> of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Hazard Identification</b> below.
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1b.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Hazard Identification</b> below.
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1c.</b>
<b>Q:</b> Does the plan include a description of the type of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Hazard Identification</b> 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 utilized the categorization of hazards as identified in California’s State Hazard Mitigation Plan, including Earthquakes, Floods, Levee Failures, Wildfires, Landslides and Earth Movements, Tsunami, Climate-Related Hazards, Volcanoes, and Other Hazards.***

Next, the Planning Team reviewed existing documents to determine which of these hazards posed the most significant threat to the City and its ability to deliver services. In other words, which hazard would likely result in a local declaration of emergency.



The geographic extent of each of the identified hazards was identified by the Planning Team utilizing maps and data contained in the Contra Costa County Hazard Mitigation Plan Draft (2018), the Clayton General Plan Safety Element (2000), and California’s Fourth Climate Change Assessment (2019). Utilizing the Calculated Priority Risk Index (CPRI) ranking technique, the Planning Team concluded the following hazards posed a significant threat against the City:

**Earthquake | Flood | Wildfire | Landslide | Epidemics/Pandemics/Vector-Borne Diseases**

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 the City of Clayton**.

<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1</b>
Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1e.</b>
<b>Q:</b> Does the plan include a description of the <b>extent</b> for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Table: Calculated Priority Risk Index Ranking</b> below.

<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B2</b>
Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B2b.</b>
<b>Q:</b> Does the plan include information on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Table: Calculated Priority Risk Index Ranking</b> below.

**Table: Calculated Priority Risk Index**  
 (Source: FEMA Emergency Management Institute – Risk Assessment Course)

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 the City of Clayton  
 (Source: Emergency Planning Consultants)**

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 (Concord Fault)	3	1.35	3	.9	4	.6	1	.1	<b>2.95</b>
Earthquake (Hayward North Fault)	3	1.35	3	.9	4	.6	1	.1	<b>2.95</b>
Earthquake (Mount Diablo Fault)	3	1.35	3	.9	4	.6	1	.1	<b>2.95</b>
Landslide	3	1.35	2	.6	4	.6	1	.1	<b>2.65</b>
Earthquake (Clayton Fault)	2	.9	3	.9	4	.6	1	.1	<b>2.50</b>
Epidemic / Pandemic / Vector-Borne	1	.45	4	1.2	1	.15	4	.4	<b>2.20</b>
Wildfire	2	.9	2	.6	3	.45	2	.2	<b>2.15</b>
Flood	2	.9	2	.6	1	.15	2	.2	<b>1.85</b>

<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1</b>
Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1b.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Profiling Hazard Events</b> below.
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1c.</b>
<b>Q:</b> Does the plan include a description of the type of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Profiling Hazard Events</b> below.

## 2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard and what part of City 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 the City of Clayton** indicates a generalized perspective of the City’s vulnerability of the various hazards according to extent (or degree), location, and probability.

<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1</b>
Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1b.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Table: Vulnerability: Location, Extent, and Probability</b> below.
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1c.</b>
<b>Q:</b> Does the plan include a description of the type of all natural hazards that can affect each jurisdiction?
<b>A:</b> See <b>Table: Vulnerability: Location, Extent, and Probability</b> below.
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1d.</b>
<b>Q:</b> Does the plan include a description of the <b>location</b> for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Table: Vulnerability: Location, Extent, and Probability</b> below.
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B1e.</b>
<b>Q:</b> Does the plan include a description of the <b>extent</b> for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Table: Vulnerability: Location, Extent, and Probability</b> below.

<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B2</b>
Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B2a.</b>
<b>Q:</b> Does the plan include information on <b>previous occurrences</b> of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Table: Vulnerability: Location, Extent, and Probability</b> below.
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B2b.</b>
<b>Q:</b> Does the plan include information on the <b>probability</b> of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Table: Vulnerability: Location, Extent, and Probability</b> below.

<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B3</b>
Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B3b.</b>
<b>Q:</b> Is there a description of each identified hazard's overall <b>vulnerability</b> (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))
<b>A:</b> See <b>Table: Vulnerability: Location, Extent, and Probability</b> below.

**Table: Vulnerability: Location, Extent, and Probability for the City of Clayton**

Hazard	Location (Where)	Extent (How Big an Event)	Probability (How Often) *	Recent Previous Occurrences
Earthquake	Entire City	<p>According to the USGS, a strong earthquake measuring greater than 5.0 on the Richter Scale occurs every 2 to 3 years and major earthquakes of more than 7.0 on the Richter Scale occur once a decade.</p> <p>The USGS estimated in 2016 that there is a 72-percent probability of at least one earthquake before 2043 with a magnitude of 6.7 or greater that could cause widespread damage in the San Francisco Bay area.</p> <p>The 2013 State of California Multi Hazard Mitigation Plan cites projections that in the next 30 years there is more than a 99-percent probability of a Magnitude 6.7 earthquake in California and a 94 percent probability of a Magnitude 7.0 earthquake.</p>	Likely	August 24, 2014: South Napa Earthquake, causing significant damage to commercial buildings and residential housing.
Flood	Town center areas located within 100-year flood zones originating from Mt. Diablo Creek and surrounding areas to include Donner and Mitchell Creek. See Flood Hazard chapter for most vulnerable locations.	100-Year Flood Zone areas subject to inundation, flooding, and flash flooding.	Possibly	February 20, 2017: copious amounts of rain caused widespread flooding, debris flow, accidents, and over topping of reservoir spillways.
Wildfire	Surrounded on North, East, and South	State Responsibility Area ratings of High to Very High Fire Hazard Severity Zone ratings	Possibly	September 1, 2020: total of 396,624 acres burned, 26 structures damaged and 222 were destroyed, and 6 people were injured by the fire that spanned 5 counties.
Landslide	Southern portions of the project area.	Ground rupture or slides along the general existing or suspected fault lines is also a possibility.	Likely	Only historical information is along Concord fault zone.
Epidemic / Pandemic / Vector-Borne Diseases	Entire City	Impacts could range from mild to severe throughout the City.	Possibly	COVID-19 (2020-present)
* Probability is defined as: Unlikely = 1:1,000 years, Possibly = 1:100-1:1,000 years, Likely = 1:10-1:100 years, Highly Likely = 1:1 year				
1 Uniform California Earthquake Rupture Forecast				

## HAZUS-MH



The hazard maps in the Mitigation Plan were generated by Emergency Planning Consultants using FEMA's Hazards United States – Multi Hazard (HAZUS-MH) software program. Please see **HAZUS Reports** for complete information (**HAZUS Reports are attached separately**). 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. It's important to note that the "project area" is based on Census Tracts not jurisdictional boundaries.

As per FEMA's HAZUS Guidebook, HAZUS is a GIS-based software that can be used to estimate potential damage, economic loss, and social impacts from earthquake, flood, tsunami and hurricane wind hazards. The HAZUS software includes nationwide general GIS datasets, and a model for the four natural disasters below. The model results can support the risk assessment piece of mitigation planning.

**Graphic: Model Results to Support Risk Assessment for Mitigation Planning**  
 (Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)

<p><b>Earthquake model</b></p> 	<p>Estimates damages and losses to buildings, essential facilities, transportation, and utility lifelines from a single scenario or probabilistic earthquake analysis. There are also tools that allow the user to integrate earthquake hazard data generated outside of Hazus into the earthquake model. This model estimates debris generation, shelter requirements, casualties, and fire following an earthquake disaster.</p>
<p><b>Flood model</b></p> 	<p>Generates flood hazard data using nationwide hydrological datasets. There are also tools that allow the user to integrate flood hazard data generated outside of Hazus software into the flood model. This model estimates the expected levels of damage to infrastructure and buildings. Debris generation and shelter requirements, as well as agricultural losses, can be calculated with this model.</p>
<p><b>Tsunami model</b></p> 	<p>Can produce analyses that have several pre-tsunami and/or post-tsunami applications. Use of the methodology will generate an estimate of the consequences to a county or region of a "scenario tsunami," i.e., a tsunami with a specified inundation depth, velocity, and location. The resulting "loss estimate" generally will describe the scale and extent of damage and disruption that may result from the scenario tsunami.</p>
<p><b>Hurricane wind model</b></p> 	<p>Can create the wind hazard data from a historical or real-time event, probabilistic event, or from a user-defined scenario. Estimates of potential damage and economic loss to buildings can then be calculated. The storm surge analysis combines the wind and coastal flood model to simulate storm surge for historical, and manual hurricanes. The model combines the wind and flood losses.</p>

HAZUS is packaged with datasets that include building inventories and infrastructure for the entire United States. Because HAZUS is currently built on GIS technology, the inventory and infrastructure datasets can be mapped and intersected with the hazard information created from the four models.

Following the intersection, HAZUS determines the effects of wind, ground shaking, and water depths on buildings and infrastructure to calculate losses and damages. The outputs and estimates can be used in hazard mitigation planning, emergency response, and planning for recovery and reconstruction.

Losses estimated in HAZUS are based on the accuracy of input data. Basic analysis can be developed using the default data and parameter data provided within HAZUS. Users can conduct more advanced analysis using more accurate data that is specific to the region, hazard, population, etc. User-supplied data improves the accuracy of inventories and/or parameters.

Advanced-level analyses may also incorporate data from third-party studies. The user must determine the appropriate level of analysis to meet the user's needs and resources.

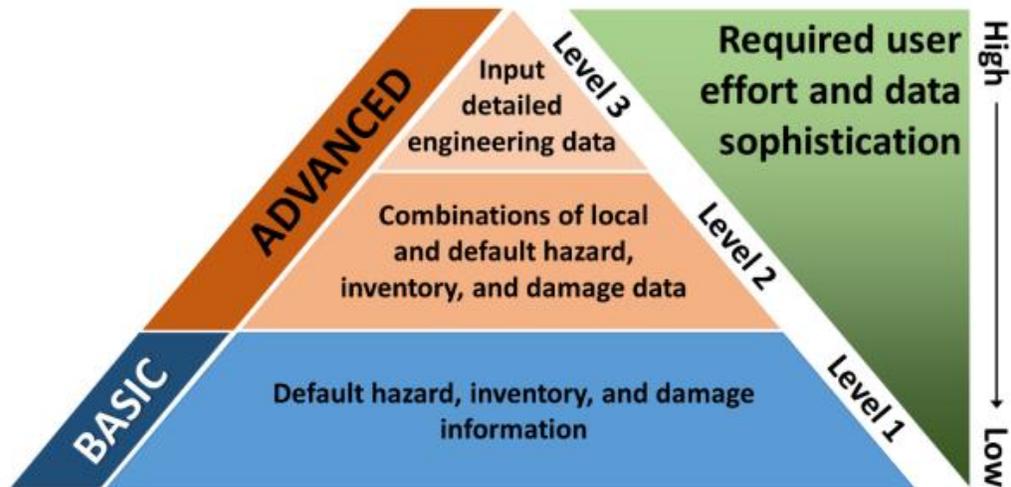
HAZUS analysis can be performed at three different levels:

- A Level 1 basic analysis can be performed simply using the default data provided. This level of analysis is very coarse, and because the results will be subject to a much higher level of uncertainty, this should serve primarily as a baseline for further study. The user will still be able to produce basic maps and results. Limited additional data will be required to complete the flood analysis. Site specific input data produces more accuracy in vulnerability identification and loss estimation amounts. If the data is available, it is highly recommended that a user integrate site specific data to reduce uncertainty associated with the results of default data. Using a user defined depth grid, in the flood model, against default state data is classified as a level 1 analysis and is the recommendation of HAZUS Program.
- A Level 2 advanced analysis increases the accuracy and precision of an analysis by incorporating user-supplied data relevant to a given hazard. While the data included with the HAZUS software can be utilized to run a basic level one analysis, level two inputs are supplied by local sources and contain a higher level of detail. This can include datasets that model the hazards in more detail, or datasets that increase the accuracy of the inventory information. Incorporating more detailed data will improve the quality of the results. Level 2 is broadly defined as the incorporation of user-defined hazard and updated GBS or site-specific data.
- A Level 3 advanced analysis achieves the highest degree of precision and involves modifying or substituting the model parameters and/or equations, relevant to a given hazard. Users can modify inputs depending on the time and resources available. Keeping track of the data used is suggested so that any relationships between input and results is documented. It is usually done by advanced users experienced with both the hazard and the HAZUS software.

FEMA's Natural Hazard Risk Assessment Program (NHRAP) encourages users to conduct Level 2 or 3 analyses to improve the accuracy of results and recommends the use of user defined data (e.g., depth grids for all flood analysis) for mitigation planning.

**Graphic: HAZUS Analysis Levels**

(Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)



HAZUS creates credible estimates for losses and damages; datasets created on the local level typically provide greater detail than the datasets that are packaged with HAZUS (Level 1). Incorporating local datasets into the analysis will improve the results.

*HAZUS Outputs*

The user plays a major role in selecting the scope and nature of the output of a HAZUS analysis. A variety of maps can be generated for visualizing the extent of the losses. Numerical results may be examined at the level of the census block or tract or may be aggregated by county or region. There are three main categories of HAZUS outputs: direct physical damage, induced damage, and direct losses. Direct physical damage includes general building stock (GBS), essential facilities, high potential loss facilities, transportation systems, utility systems, and user defined facilities. Induced damage includes building debris, tree debris generation and fire following disaster occurrence. Direct losses include losses for buildings, contents, inventory, income, crop damage, vehicle loss, injuries, casualties, sheltering needs and displaced households.

Graphic: HAZUS Outputs  
 (Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)

Hazus Capabilities	Earthquake Ground Shaking Ground Failure	Flood Frequency   Depth Riverine   Coastal Surge	Hurricane Wind   Surge	Tsunami Depth   Momentum Flux   Runup   Velocity
<b>Inputs</b>				
Historic	✓		✓	
Deterministic	✓	✓	✓	✓
Probabilistic	✓	✓	✓	
User-supplied	✓	✓	✓	✓
Other supported inputs	Real-time & scenario USGS ShakeMaps	Risk MAP, User-supplied depth grids (ArcGRID, GeoTIFF, IMAGINE), HEC-RAS (.FLT)	Hurrevac, User-supplied wind files (.dat)	NOAA PMEL SIFT, State models
<b>Direct Damage</b>				
General Building Stock	✓	✓	✓	✓
Essential Facilities	✓	✓	✓	
Transportation Systems	✓	✓		
Utility Systems	✓	✓		
User-Defined Facilities	✓	✓	✓	✓
<b>Induced Damage</b>				
Fire Following	✓			
Debris Generation	✓	✓	✓	
<b>Direct Losses</b>				
Cost of Repair	✓	✓	✓	✓
Income Loss	✓	✓	✓	✓
Agricultural		✓		
Casualties	✓			✓
Shelter and/or Evacuation Needs	✓	✓	✓	✓
Average Annualized Loss (AAL)	✓	✓	✓	

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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 **Vulnerability Assessment/Inventory of Existing Assets** below.

### 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 Facilities Vulnerable to Hazards** below illustrates the hazards with potential to impact critical facilities owned by or providing services to the City.

<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B3</b>
Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B3a.</b>
<b>Q:</b> Is there a description of each hazard’s <b>impacts</b> on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))
<b>A:</b> See <b>Table: Critical Facilities Vulnerable to Hazards</b> below.
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B3b.</b>
<b>Q:</b> Is there a description of each identified hazard’s overall <b>vulnerability</b> (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))
<b>A:</b> See <b>Table: Critical Facilities Vulnerable to Hazards</b> below.

**Table: Critical Facilities Vulnerable to Hazards**  
 (Source: Emergency Planning Consultants)

City Assets	Earthquake	Flood	Wildfire	Epidemic / Pandemic / Vector-Borne Disease	Landslide
Corporation Yard, 5901 Heritage Trail	X	X		X	
City Hall, 6000 Heritage Circle	X	X		X	
Clayton Library, 6125 Clayton Road	X	X		X	
Endeavor Hall, 6008 Center Street	X	X		X	
Keller House, 1760 Clayton Road	X	X		X	
Clayton Community Park Restroom Building, Regency Drive	X			X	X
The Grove Park Restroom Building, 6100 Main Street	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 Clayton in the **City 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 Clayton 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.

# Earthquake Hazards

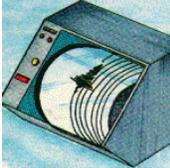
## Hazard Definition

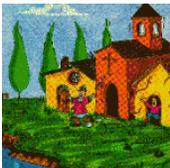
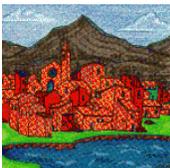
An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure.



One 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 X 10) more powerful than a M5 earthquake and releases 1,024 times (32 X 32) the energy. See Table: Modified Mercalli Intensity Scale below:

**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.

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	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 wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clock stop, start, change rate.
	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.

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	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.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2**

Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**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** below.

## Previous Occurrences of Earthquakes

The most recent earthquake to affect the area near the City was the South Napa Earthquake on August 24, 2014. According to USGS, the shaking caused some damage to wood-frame houses and significant damage to some commercial buildings in downtown Napa, including the 1870 courthouse. Damage to wood-frame houses was mostly broken or cracked chimneys and failure of cripple walls, short walls in the crawl space between the foundation and the floor. A few homes even shifted off of their foundations, which can be due to the failure of the cripple walls, which drop the floor to the foundation and sometimes allow houses to slide off the foundation.

According to the Contra Costa Local Hazard Mitigation Plan Draft (2018), California has been included in 12 FEMA major disaster (DR) or emergency (EM) declarations for earthquakes. Contra Costa County was included in only one declaration: DR-845 for the Loma Prieta Earthquake, which occurred in October 1989. The declaration for this event also covered Alameda, Marin, Monterey, Sacramento, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, and Solano Counties.

**Table: Recent Earthquakes Magnitude 5 or Higher Impacting the Bay Area**  
 (Source: Contra Costa County Hazard Mitigation Plan Draft, 2018)

Date	Earthquake Name	Epicenter Location	Magnitude
8/24/2014	South Napa Earthquake	South Napa	6.0
10/20/2012	King City Earthquake	28 km east-northeast of King City, CA	5.3
10/31/2007	Alum Rock Earthquake	San Francisco Bay area, California	5.6
5/14/2002	Gilroy Earthquake	Northern California	5
9/3/2000	Yountville Earthquake	Northern California	5
8/12/1998	San Juan Bautista Earthquake	Central California	5.2
4/18/1990	Northern California	Near Aromas, Northern California	5.4
10/18/1989	Loma Prieta Earthquake	Northern California	7.2
8/8/1989	Santa Cruz County Earthquake	Central California	5.2
6/27/1989		Northern California	5.3
6/13/1988		San Francisco Bay area, California	5.3
2/20/1988		Central California	5.1
3/31/1986		Northern California	5.6
1/26/1986		Central California	5.4

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1**

Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

**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.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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 Contra Costa County Hazard Mitigation Plan Draft (2018), the Bay region lies within the active boundary between the Pacific and the North American tectonic plates. The Pacific Plate is constantly moving northwest past the North American Plate at a rate of about 2 inches per year (Cal OES, 2013). Earthquakes in the San Francisco Bay region result from strain energy constantly accumulating across the region because of the motion of the Pacific Plate relative to the North American Plate. The San Andreas Fault, on which earthquakes of magnitude 7.8 and 7.9 have occurred in the past, including the 1906 San Francisco earthquake, is the fastest slipping fault along the plate boundary.

Contra Costa County is located in a region of high seismicity with numerous local faults. The primary seismic hazard for the county is potential ground shaking from these faults, especially the Hayward, Calaveras North, Concord-Green Valley, Mount Diablo, and Greenville faults, which are

further described below. California experiences hundreds of earthquakes each year, most with minimal damage and magnitudes below 3.0 on the Richter Scale. Earthquakes that cause moderate damage to structures occur several times a year. According to the USGS, a strong earthquake measuring greater than 5.0 on the Richter Scale occurs every 2 to 3 years and major earthquakes of more than 7.0 on the Richter Scale occur once a decade. The USGS estimated in 2016 that there is a 72-percent probability of at least one earthquake before 2043 with a magnitude of 6.7 or greater that could cause widespread damage in the San Francisco Bay area. The 2013 State of California Multi-Hazard Mitigation Plan cites projections that in the next 30 years there is more than a 99-percent probability of a Magnitude 6.7 earthquake in California and a 94 percent probability of a Magnitude 7.0 earthquake. Probabilities for earthquakes on major fault lines in the San Francisco Bay Area have been estimated by the USGS in a 2016 report. The Hayward and Rodgers Creek Faults have high potential for experiencing major to great events.

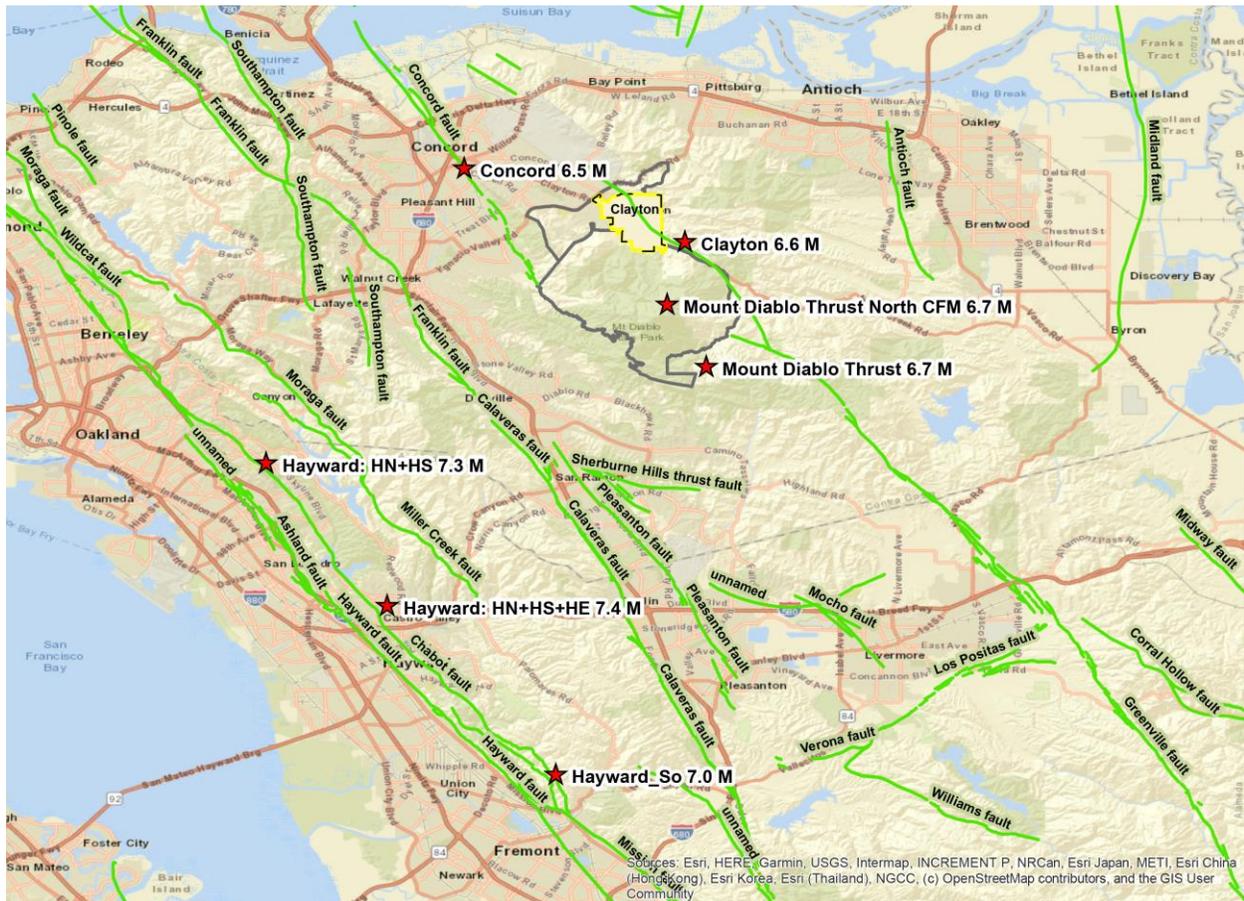
USGS ground motion maps, based on current information about fault zones, show the PGA that has a certain probability of being exceeded in a 50-year period. The maps, last updated in 2014 with the best currently available data, show that the PGA with a 10-percent probability of exceedance in 50 years for Contra Costa County is 0.4g. The Association of Bay Area Governments (ABAG) estimates a potential loss of 159,000 housing units in Bay Area communities after a large earthquake. This loss would have disastrous effects on local and regional economies. Recovery, repair, and rebuilding time for each household would be lengthy.

Earthquakes can cause disastrous landslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction occurs when water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and float freely in the water, turning the ground into a pudding-like liquid. Building and road foundations lose load-bearing strength and may sink into what was previously solid ground. Unless properly secured, hazardous materials can be released, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary risks for earthquakes. Earthen dams and levees are highly susceptible to seismic events, and the impacts of their eventual failures can be considered secondary risk exposure to earthquakes. Depending on the location, earthquakes can also trigger tsunamis. Tsunamis significantly damage many locations beyond what the earthquake struck; however, coastal communities near the earthquake epicenter that are also vulnerable to tsunamis could experience devastating impacts. Additionally, fires can result from gas lines or power lines that are broken or downed during the earthquake. It may be difficult to control a fire, particularly if the water lines feeding fire hydrants are also broken.

With the abundance of fault exposure in the Bay Area, the potential scenarios for earthquake activity are many. An earthquake does not have to occur within the planning area to have a significant impact on the people, property and economy of the planning area. Any seismic activity of 6.0 or greater on faults within the planning area would have significant impacts throughout the planning area. Potential warning systems could give approximately 40 seconds notice that a major earthquake is about to occur. This would not provide adequate time for preparation. Earthquakes of this magnitude or higher would lead to massive structural failure of property on NEHRP C, D, E, and F soils. Levees and revetments built on these poor soils would likely fail, representing a loss of critical infrastructure. These events could cause secondary hazards, including landslides and mudslides that would further damage structures. River valley hydraulic-fill sediment areas are also vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction would occur in water-saturated sands, silts or gravelly soils.

Following are descriptions of several regional faults as identified in the Contra Costa County Hazard Mitigation Plan (2018) and the Clayton General Plan Safety Element (2000).

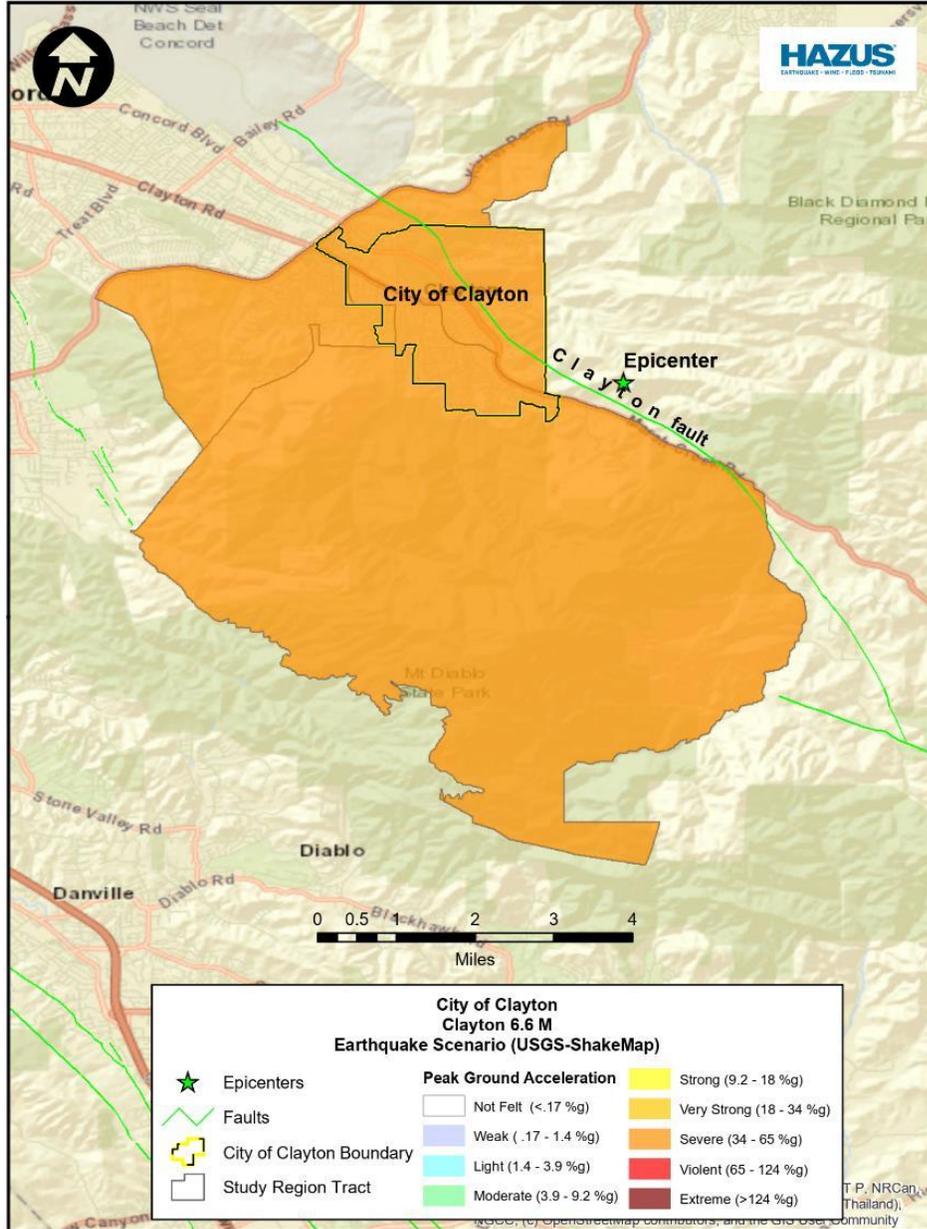
**Map: Local Faults included in HAZUS**  
**(Source: Emergency Planning Consultants)**  
**\*Each of these faults are included in Attachment: HAZUS.**



### Clayton Fault

According to Clayton’s General Plan Safety Element (2000), Clayton Valley does contain alluviated areas which could amplify ground shaking in the event the Concord fault shifts. The entire area is considered seismically active, and the development plans should reflect this risk factor. Soil types, topography and bedrock may serve to heighten risk or dampen it. The presence of contained water bodies within these seismically active areas raises seiches as potential hazards, which should also be addressed in development plans. The fault is not classified as active; however, there is preliminary evidence that the fault may have displaced recent landslide materials. Due to this the fault should be treated as active unless evidence proves otherwise. The fault does not fall within the Alquist-Priolo requirements.

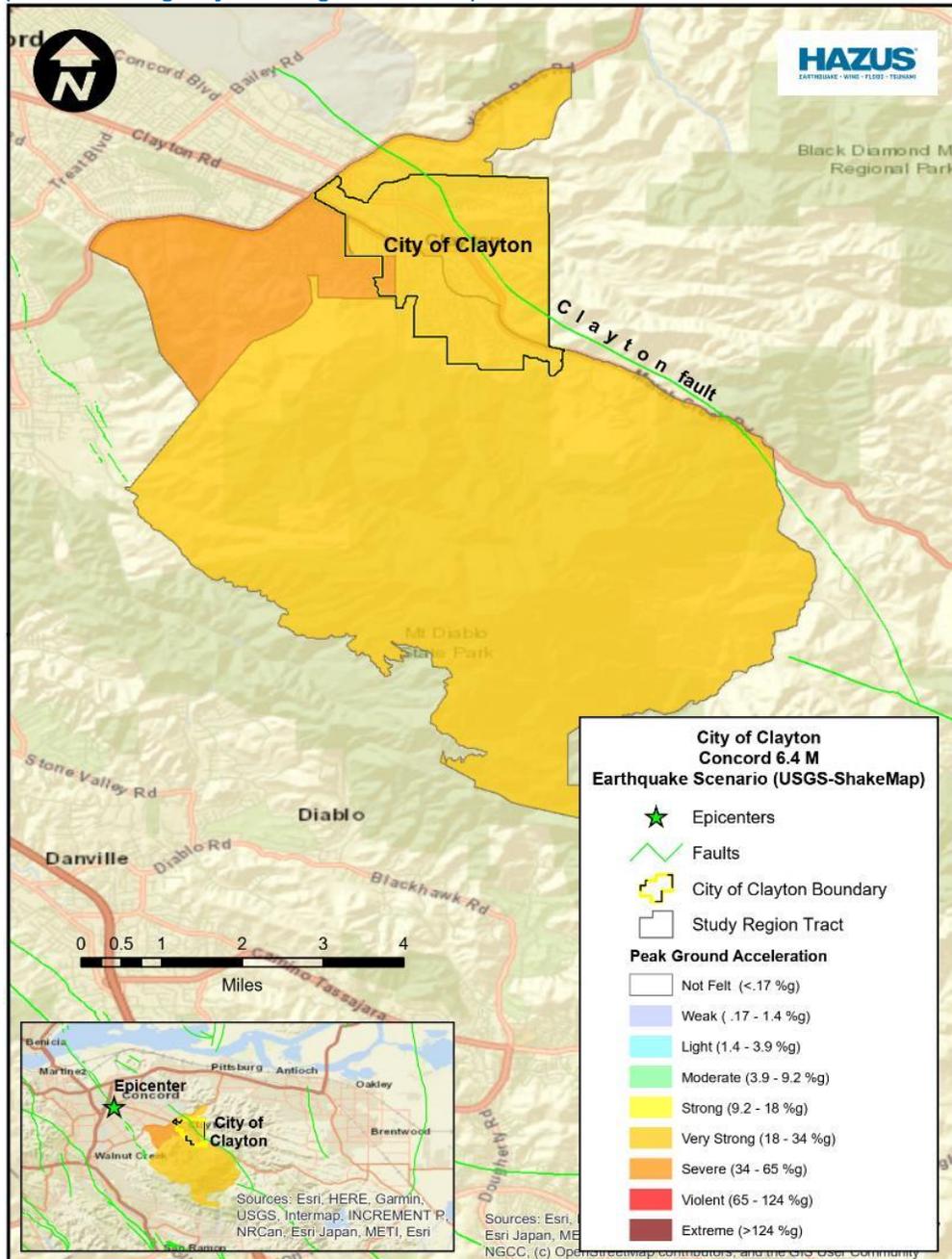
Map: HAZUS – Clayton M6.6  
(Source: Emergency Planning Consultants)



### Concord Fault

The Concord Fault, named for being located under the City of Concord, is connected to the main Green Valley Fault. The fault extends approximately 11 miles east of West Napa Fault, from Mount Diablo to the Carquinez Strait. It is considered to be under high stress and has a 16 percent probability of experiencing a Magnitude 6.7 or greater earthquake in the next 30 years. According to the Clayton General Plan Safety Element (2000), The Concord fault is known to be active. It is a creeping fault, and small to moderate quakes are possible along the fault, with the capability of a 7+ magnitude.

Map: HAZUS – Concord M6.4  
(Source: Emergency Planning Consultants)



### Hayward North Fault

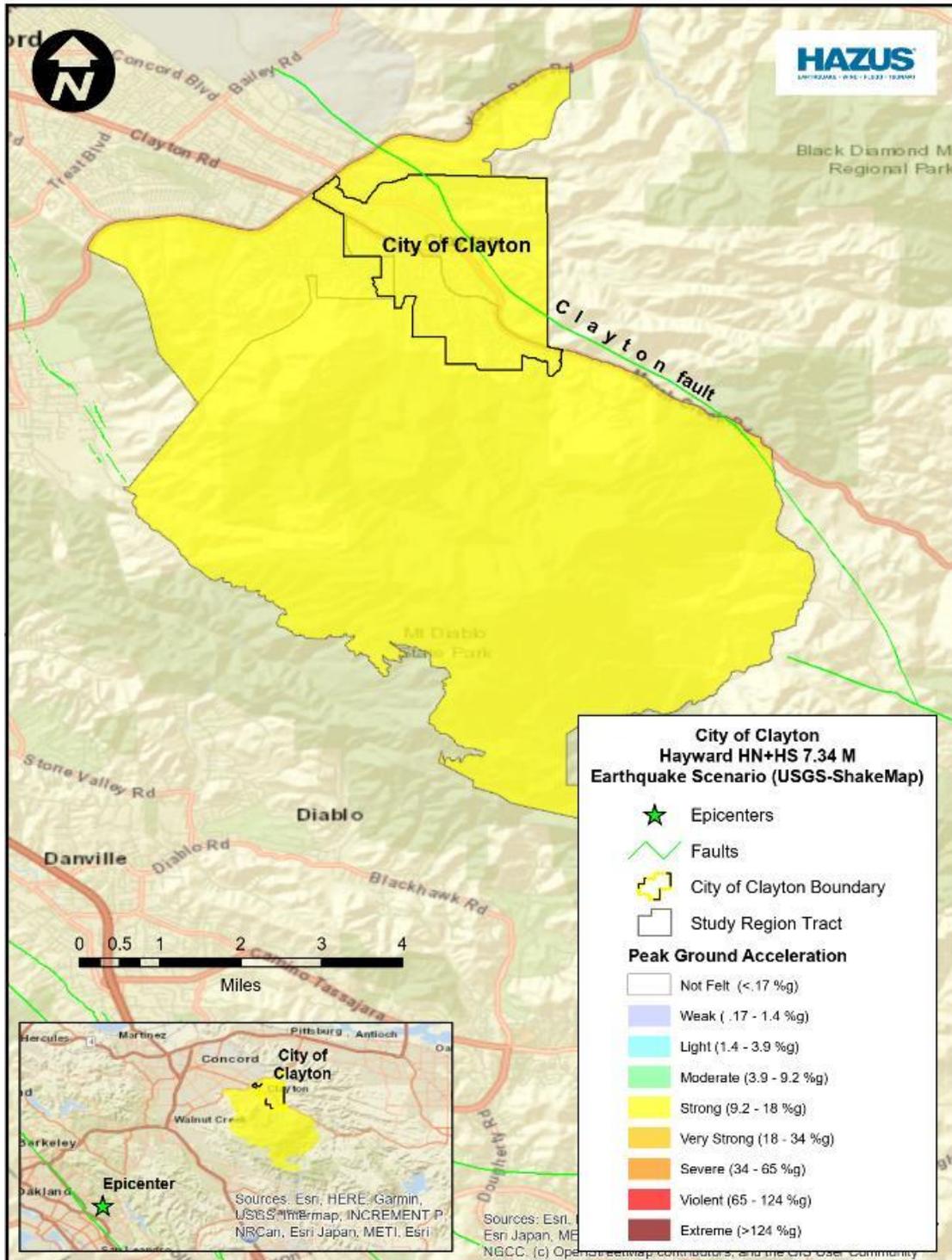
The Hayward Fault is an approximately 45-mile-long fault that runs through densely populated areas on the East Bay, parallel to the San Andreas Fault. The Hayward Fault extends through some of the Bay Area’s most populated areas, including San Jose, Oakland, and Berkeley. The Hayward Fault is a right lateral slip fault. It is increasingly becoming a hazard priority throughout the Bay Area because of its increased chance for activity and its intersection with highly populated areas and critical infrastructure. The probability of experiencing a Magnitude 6.7 or greater earthquake along the Hayward Fault in the next 30 years is 33 percent. An earthquake of this

Hazard Mitigation Plan | 2021

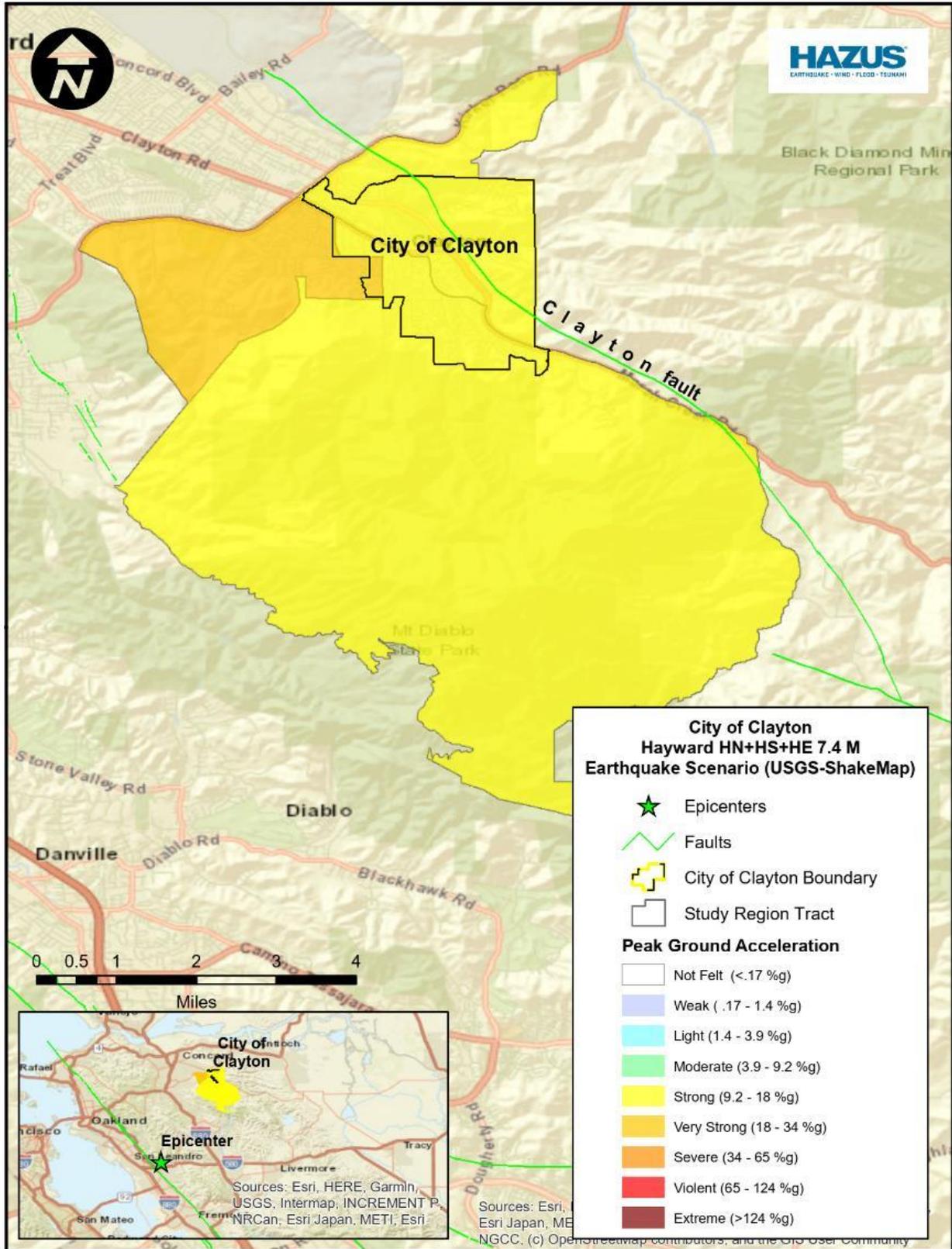
Earthquake Hazards

magnitude has regional implications for the entire Bay Area, as the Hayward Fault crosses transportation and resource infrastructure, such as multiple highways and the Hetch-Hetchy Aqueduct.

Map: HAZUS – Hayward M7.34  
(Source: Emergency Planning Consultants)



Map: HAZUS – Hayward M7.4  
 (Source: Emergency Planning Consultants)

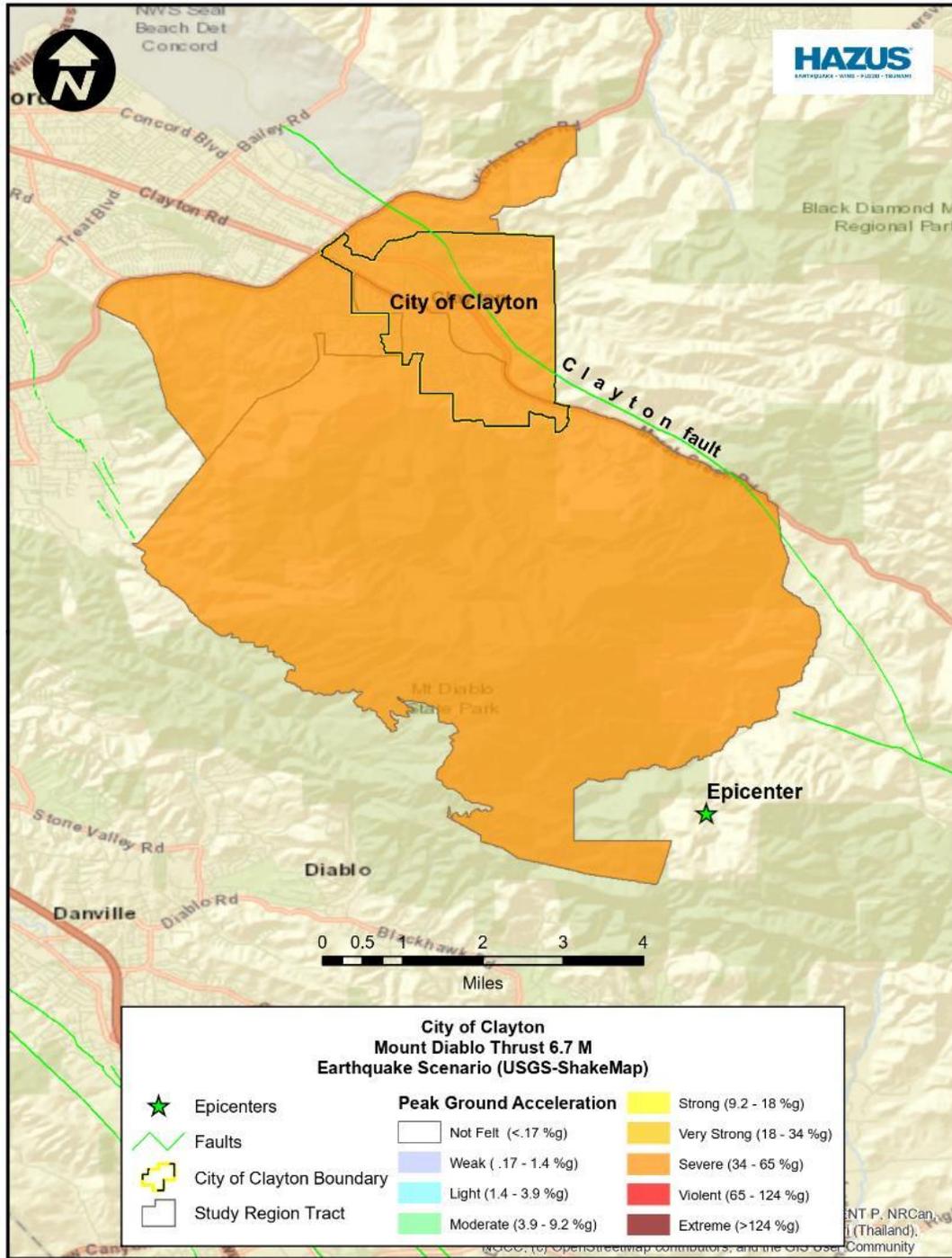




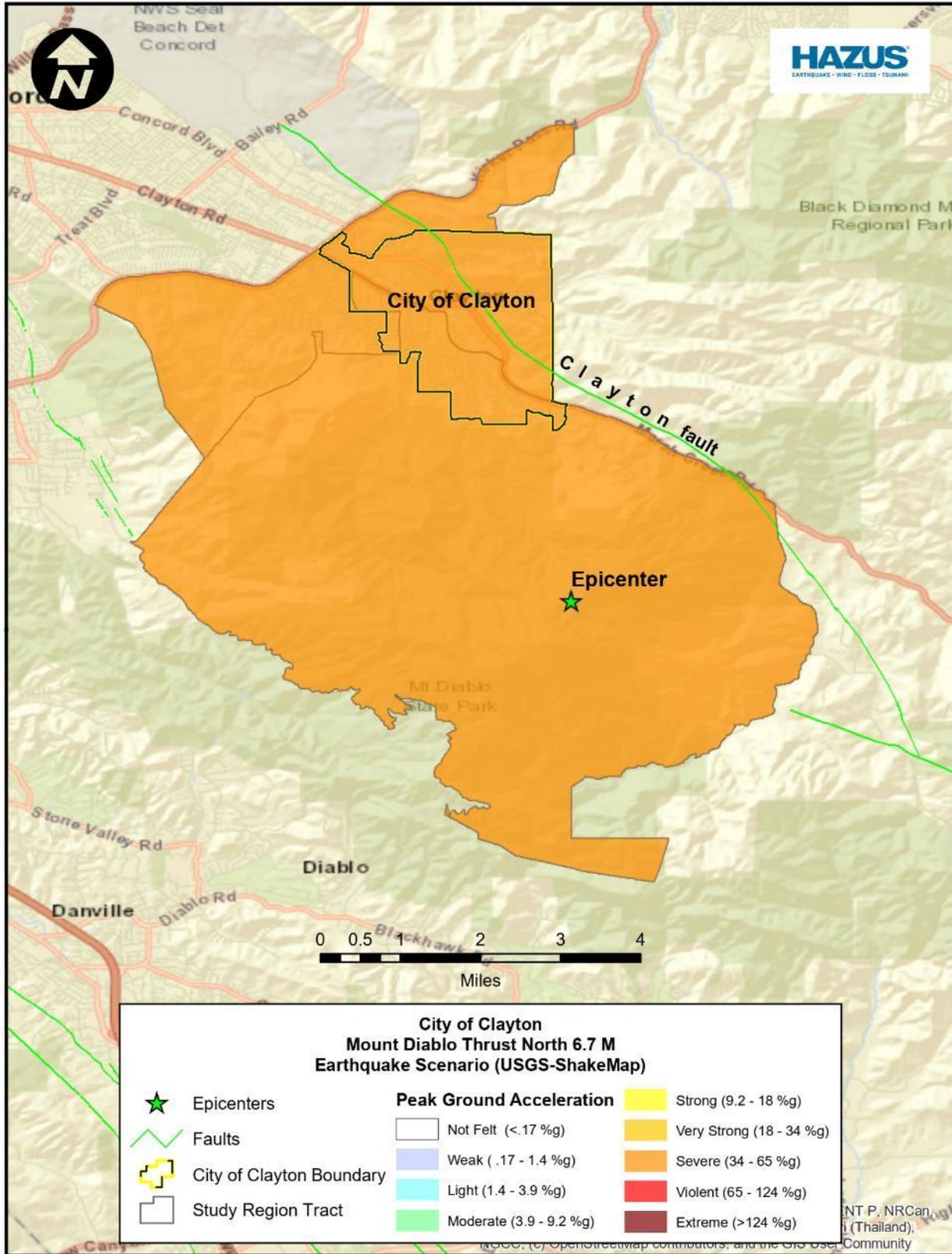
### Mount Diablo Fault

The Mount Diablo thrust fault is in the vicinity of Mount Diablo in Contra Costa County. The fault lies between the Calaveras Fault, the Greenville Fault, and the Concord Fault, all right-lateral strike slip faults, and appears to transfer movement from the Calaveras and Greenville Faults to the Concord Fault, while continuing to uplift Mount Diablo.

Map: HAZUS – Mt. Diablo Thrust M6.7  
(Source: Emergency Planning Consultants)



Map: HAZUS – Mt. Diablo Thrust North M6.7  
 (Source: Emergency Planning Consultants)



## Earthquake Related Hazards

Ground shaking, landslides, and liquefaction 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.

### *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 California have a high likelihood of encountering such risks, especially in areas with steep slopes.

Rock falls may happen suddenly and without warning but are more likely to occur in response to earthquake induced ground shaking, during periods of intense rainfall, or as a result of human activities, such as grading and blasting. Ground acceleration of at least 0.10g in steep terrain is necessary to induce earthquake-related rock falls.

### *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.

See **Map: Seismic Hazard Zones** in the Landslide section for location of liquefaction and earthquake-induced landslide areas.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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** below.

## Impact of Earthquakes

Based on the risk assessment, it is evident that earthquakes will continue to have potentially devastating economic impacts to 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 citizens as temporary facilities and relocations would likely be needed.

### *Impacts of Climate Change on Earthquakes*

The impacts of global climate change on earthquake probability are unknown. Some scientists say melting glaciers could induce tectonic activity. As ice melts and waters runs off, tremendous amounts of weight are lifted off the Earth’s crust. As the newly freed crust settles back to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA, 2004).

The secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms could fail prematurely during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events. Wildfire risks associated with earthquakes could be significantly enhanced by drought conditions triggered by climate change. There are currently no models available to estimate these impacts.

# Wildfire Hazards

## Hazard Definition

A wildfire is an uncontrolled fire spreading through vegetative fuels and exposing or possibly consuming structures. They often begin unnoticed and spread quickly. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. A wildland/urban interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.



## Wildfire Characteristics

There are three categories of wildland/urban interface fire: The classic wildland/urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas; the mixed wildland/urban interface is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings. The occluded wildland/urban interface exists where islands of wildland vegetation occur inside a largely urbanized area. Certain conditions must be present for significant interface fires to occur. The most common conditions include hot, dry and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started, several conditions influence its behavior, including fuel topography, weather, drought, and development.



<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B2</b>
Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B2a.</b>
<b>Q:</b> Does the plan include information on <b>previous occurrences</b> of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))
<b>A:</b> See <b>Previous Occurrences of Wildfire</b> below

## Previous Occurrences of Wildfire

The most recent significant wildfire event to impact Contra Costa County was the SCU (Santa Clara Unit) Lightning Complex Fire. The SCU Lightning Complex fires continued to burn through September before full containment was reached on the morning of October 1st. The SCU fires became the third largest wildfire in California state history. A total of 396,624 acres burned, 26 structures damaged and 222 were destroyed, and 6 people were injured by the fire that spanned 5 counties.

According to the National Oceanic and Atmospheric Administration’s Storm Events Database (2021) some of the County’s most destructive fires within the last five years include:

**Table: Wildfires in Contra Costa County, 2019-2020**  
(Source: NOAA Storm Events Database)

Date	Location	Name of Fire	Damage
09/01/2020	East Bay Hills and the Diablo Range	SCU Lightning Complex Fires	The SCU Lightning Complex fires continued to burn through September before full containment was reached on the morning of October 1st. The SCU fires became the third largest wildfire in California state history. A total of 396,624 acres burned, 26 structures damaged and 222 were destroyed, and 6 people were injured by the fire that spanned 5 counties.
08/16/2020	East Bay Hills and the Diablo Range	SCU Lightning Complex Fires	The area experienced wind gusts of 40-50 mph with isolated areas seeing gusts of 60-75 mph. Lightning strikes in combination with gusty and erratic outflow winds sparked hundreds of wildfires across the state of California. Hundreds of thousands of acres have been burned with several hundred structures destroyed as well as a handful of deaths and injuries. Tens of thousands of residents were also forced to evacuate. Additionally, all of these wildfires burning simultaneously across the state gave the Bay Area the worst air quality in the world at one point. This complex became one of the top 5 largest fires in California State history prompting numerous evacuations, destroying nearly 400,000 acres and destroying over 200 structures. These fires resulted in 6 injuries (Civilian and Fire Personnel). The fires came dangerously close to the historic Lick Observatory on Mount Hamilton
07/20/2020	East Bay Interior Valleys	The Holland Fire	The Holland Fire broke out northeast of Brentwood in late July. The vegetation fire was fueled by breezy winds that afternoon and prompted evacuations near the Brentwood Marina.
07/06/2020	East Bay Interior Valleys, East Bay Hills and the Diablo Range	The California Fire	A ridge of high pressure over the desert southwest brought warm and dry conditions across the Central Coast and Bay Area around the Fourth of July. A handful of wildfires that broke out that weekend were aided by breezy onshore winds towards the

			end of the weekend and into the start of the following week. Some of the fires prompted the issuance of evacuations across the region.
06/06/2020	East Bay Interior Valleys	The Willow Fire	An upper low along with a second shortwave trough moved through the region the first weekend of June. A strong onshore pressure gradient brought gusty winds to much of the area. Observations showed gusts of 40 to 60 mph throughout the Bay Area and Central Coast. These winds fueled multiple grass and vegetation fires throughout the area, some of which prompted evacuations.
10/27/2019	East Bay Interior Valleys	The Forest Fire	Wind gusts 60 to 80 mph, with a peak of 102 mph was recorded near the Kincade Fire. These winds promoted rapid growth of the Kincade Fire and along with very dry conditions allowed for multiple new wildfires to spark in the greater Bay Area. A large amount of the community in Sonoma County was evacuated downwind of the Kincade Fire in response. Prior to the event PG&E shut off power to over 2 million people across the state of California. The fire burned about 50 acres but no structures were destroyed and no injuries reported
10/24/2019	East Bay Hills and the Diablo Range	The Mines Fire	Strong surface high pressure building over the Great Basin and a trough along the California coast provided the set up for strong and dry offshore winds over the greater Bay Area. The first event brought strong N to NE winds to the region, particularly the North Bay, where gusts of 50 to 70 mph were observed. Healdsburg Hills North Station had a peak gust of 76 mph the night of the 23rd. These conditions fed the rapid growth of the Kincade. Prior to the event PG&E shut off power to roughly 1 million people across the state of California. The Mines Fire burned 35 acres
10/10/2019	East Bay Interior Valleys	N/A	Scattered wildfires broke out across Northern California on Thursday the 10th at least one of which prompted the issuance of evacuations. Ultimately no structures were destroyed
08/07/2019	East Bay Interior Valleys	N/A	A brush fire in Oakley prompted evacuations and a preemptive power shutoff for 5600 customers. Fire officials said 58 acres were burned and 2 structures were destroyed.
06/11/2019	East Bay Hills and the Diablo Range	N/A	The combination of high pressure and strong offshore flow resulted in an early season heat wave across the Bay Area from June 9th to the 11th. Approximately 56,000 people across the region lost power. Three fatalities were reported during the heat event. One man died as a direct result of heat related illness while two others drowned while attempting to cool down during the heat wave. Hot temperatures and dry grass resulted in a vegetation fire that spread to a residence.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1**

Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

**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.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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

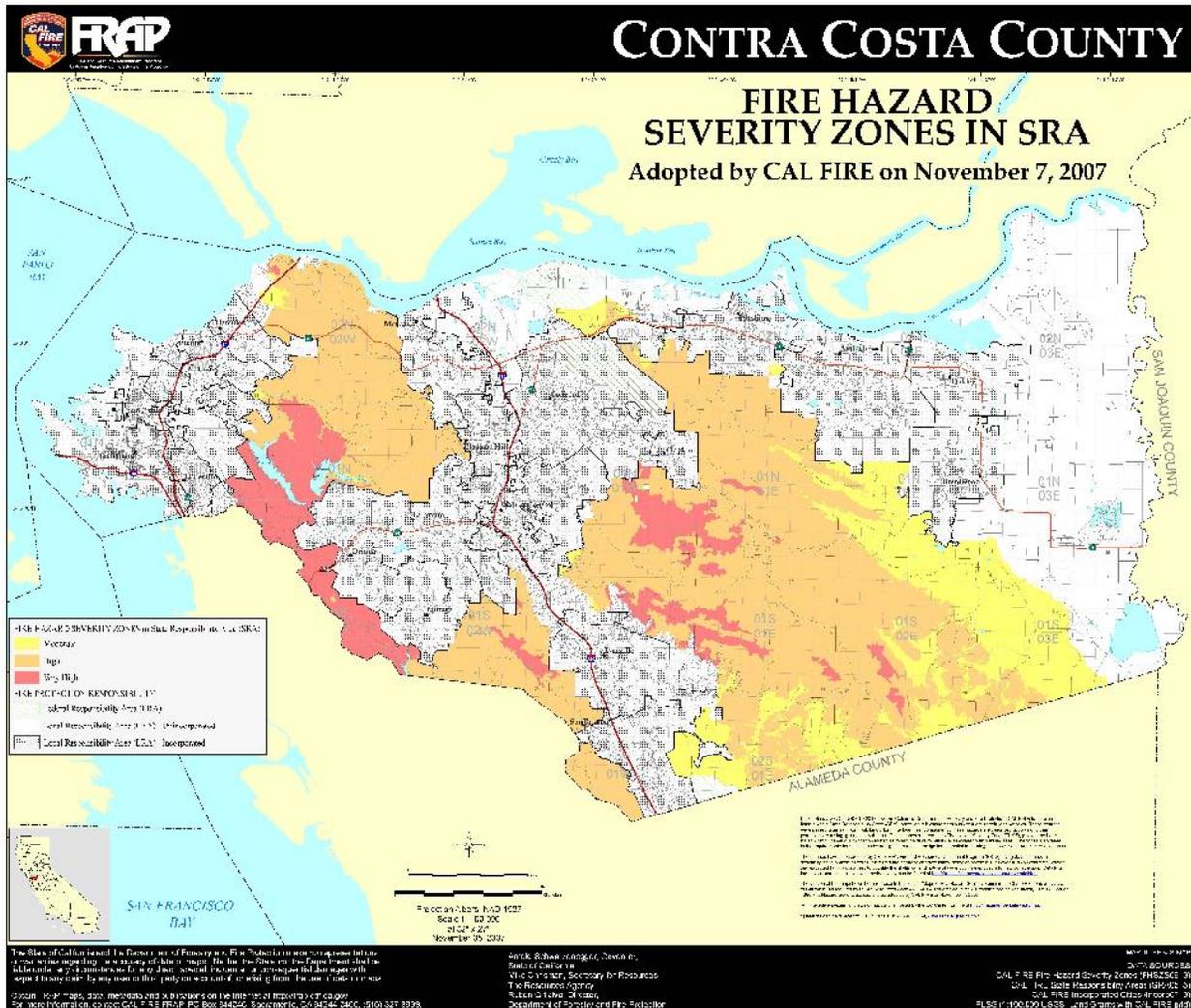
The Clayton General Plan Safety Element (2000) points out that because the natural vegetation in the trail system and adjacent parklands is extremely flammable during the summer and fall, wildfire is a serious hazard in the City of Clayton. Slopes, high winds, and difficulty in access increase the hazards. Traffic congestion in the case of fire can hinder fire-fighting. Isolated homes set in wooded canyons or on ridge tops with only one narrow, winding, or steep road are subject to a high fire hazard. Fire services are provided by the Contra Costa Fire District. A station is located on Mitchell Canyon and Clayton Road. It is important that the City ensure that there exists: 1) adequate peak load water supply for fire-fighting, 2) all-weather road construction adequate for fire-fighting equipment, and 3) that construction be built to proper code standards. It is important to establish a program to reduce the amount of dry brush with the Greenbelt System.

According to the Contra Costa County Hazard Mitigation Plan Draft (2018), the geography, weather patterns and vegetation in the East Bay area provide ideal conditions for recurring wildfires. Parts of Walnut Creek, including the area surrounding Rossmoor, are vulnerable to wildfires, as are Clayton, the Danville/San Ramon area, and the San Pablo-El Cerrito, El Sobrante area. Because the natural vegetation and dry-farmed grain areas of the county are extremely flammable during late summer and fall, wildfire is a serious hazard in undeveloped areas and on large lot home sites with extensive areas of un-irrigated vegetation. Grassland fires are easily ignited, particularly in dry seasons. These fires are relatively easily controlled if they can be reached by fire equipment; the burned slopes, however, are highly subject to erosion and gullyng. While brush-lands are naturally adapted to frequent light fires, fire protection in recent decades has resulted in heavy fuel accumulation on the ground. Brush fires, particularly near the end of the dry season, tend to burn fast and very hot, threatening homes and leading to serious destruction of vegetative cover. A brush fire that spreads to a woodland can generate a destructive hot crown fire. No suitable management technique of moderate cost has been devised to reduce the risk of brush fires. Peat fires represent a special hazard in that once ignited, they are extremely difficult to extinguish. In some instances, islands have been flooded in order

to extinguish peat fires. Any area lying landward of the mean high-water line may be peaty due to the marshy origin of the soil.

As shown in the map below, the City is identified as a Non-Very High Fire Severity Zone, however it is surrounded to the north, east, and south by High and Very High Fire Severity Zones.

**Map: Fire Hazard Severity Zones in State Responsibility Area**  
 (Source: Contra Costa County Hazard Mitigation Plan Draft, 2018)



**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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 Wildfire** below.

## Impact of Wildfire

Wildfires and their impact vary by location and severity of any given wildfire event. Based on the risk assessment, it is evident that wildfires will continue to have potentially devastating economic impacts to the City. Impacts that are not quantified, but 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 citizens as temporary facilities and relocations would likely be needed.

### *Impacts of Climate Change on Wildfires*

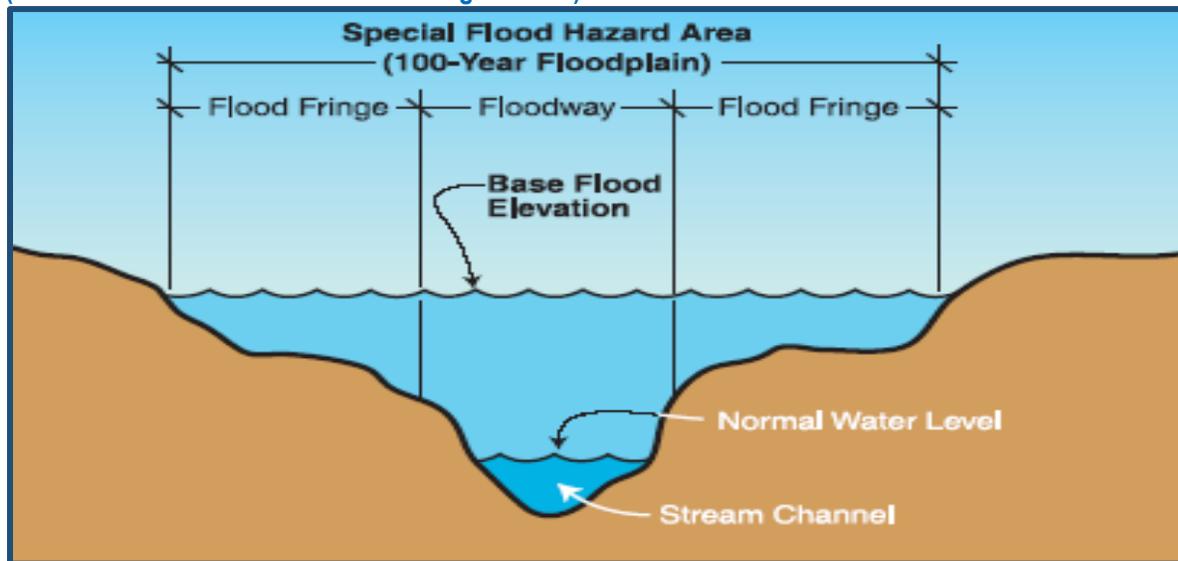
According to California's Fourth Climate Change Assessment (2019), where fires are fuel limited (as in the desert), changes in fire depend on whether future climates have higher or lower rainfall. In the Bay Area, although there is a strong moisture gradient from the coast inland, fire is not generally fuel limited. As a result, there are more consistent projections of increased fire activity (i.e., more frequent or greater area burned), due to a warmer climate. It is suggested that future fire activity will be driven as much by changes in human development as by changes in climate. Continued development will likely dampen fire probabilities in areas closest to high-density human development, while potentially increasing fire risk where development expands in the wildland urban interface. There is a projected increase in fire probability in most of the Bay Area, especially the dry hills around Mt. Hamilton, with reduced fire risk near urban areas and development corridors. Continued building in the wildland-urban interface exposes more structures to fire risk and also alters fire probabilities. On the other hand, improved building codes and management of defensible space around structures can significantly reduce losses when fires do occur.

# Flood Hazards

## Hazard Definition

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. 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.

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



## Types of Flooding

Two types of flooding primarily affect the region: slow-rise or flash flooding. Slow-rise floods 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.

### ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

### 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** below.

## Previous Occurrences of Flooding

The most recent flooding event to affect in the City occurred on February 20, 2017. The event brought copious amounts of rain to the region causing widespread flooding, debris flow, accidents, and over topping of reservoir spillways. Fortunately, no injuries or deaths resulted from the flood. Contra Costa County has endured several flooding events over the past six years detailed in the table below:

**Table: Flooding Events within Contra Costa County, 2018-2020**  
 (Source: NOAA Storm Events Database)

Date	Location
01/16/2020	San Ramon
01/16/2020	Martinez
12/07/2019	Pacheco
11/26/2019	Walnut Creek
03/06/2019	Orinda
03/06/2019	Las Juntas
02/26/2019	Hookston
02/14/2019	Oleum
02/14/2019	Richmond
02/13/2019	San Pablo
02/13/2019	Vinehill
02/09/2019	Monsanto
01/06/2019	Orinda
11/23/2018	Walnut Creek
04/07/2018	Selby
03/01/2018	Vinehill
03/01/2018	Selby
01/09/2018	East Richmond
01/09/2018	Walnut Creek
01/08/2018	Alamo
01/08/2018	Walnut Creek

### ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1

Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

#### 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.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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

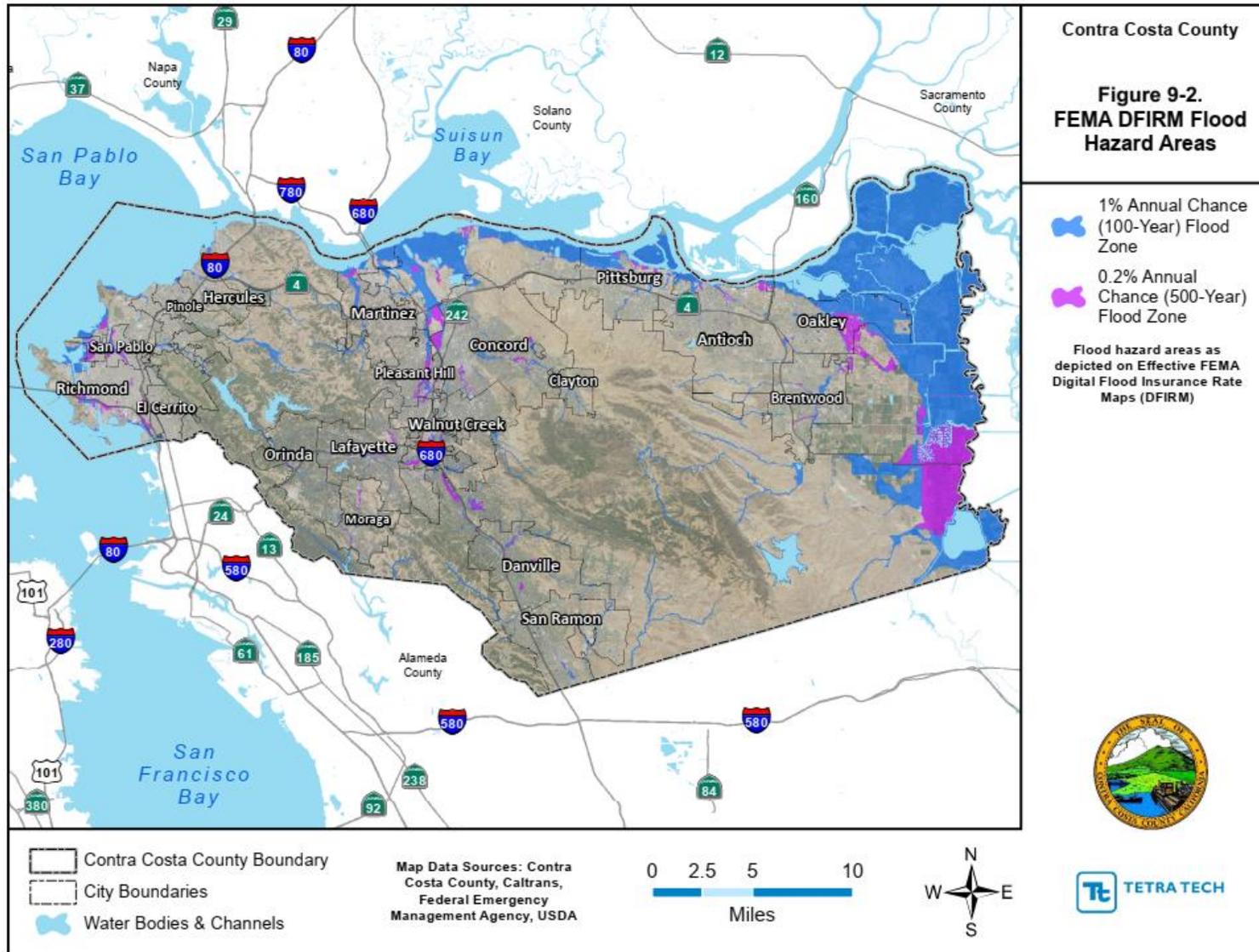
According to the Contra Costa County Hazard Mitigation Plan Draft (2018), the major floods in the planning area have resulted from intense weather rainstorms between November and March. The flooding that has occurred in portions of the planning area has been extensively documented by gage records, high water marks, damage surveys and personal accounts. This documentation was the basis for the September 30, 2015 DFIRMs generated by FEMA for Contra Costa County. The 2015 Flood Insurance Study is the sole source of data used in this risk assessment to map the extent and location of the flood hazard, as shown in **Map: FEMA DFIRM Flood Hazard Areas**.

According to the Safety Element of the General Plan (2000), the principal stream running through Clayton is Mt. Diablo Creek. It originates on the steep north slopes of the 3,849-foot Mt. Diablo. Mt. Diablo Creek drains a watershed of approximately 30 square miles. It flows northerly and westerly through the cities of Clayton and Concord, the Concord Naval Weapons Station and eventually empties into Suisun Bay. In the City of Clayton, Mt. Diablo Creek is joined by Donner and Mitchell creeks, both of which originate on the slopes of Mt. Diablo and by Peacock Creek, which flows from the Keller Ridge. Flooding has occurred from Mt. Diablo Creek in the Town Center area of Clayton and in the flood plain between Clayton Road and Kirker Pass Road. The major floods affecting this area occurred in 1938, 1952, 1955 and 1963. The 1955 and 1963 floods both were estimated as 25-year floods.

Despite these occurrences, Mt. Diablo Creek is not considered a creek with a high flood history. The long flood plain between Mt. Diablo and the City boundaries slows velocity and delays peak flows. As the Mt. Diablo Creek watershed continues to develop, the potential for serious flooding increases.

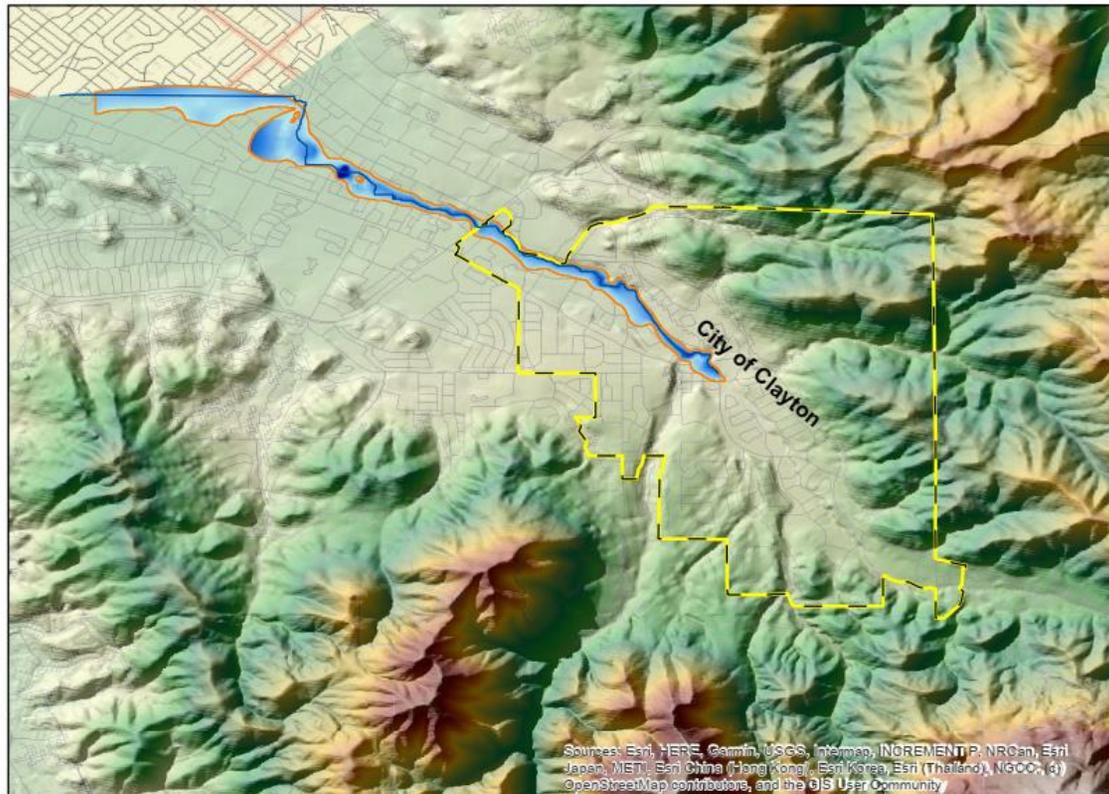
The FEMA FIRM maps below show the City’s 100-Year and 500-year flood plain potential.

**Map: FEMA DFIRM Flood Hazard Areas**  
 (Source: Contra Costa County Hazard Mitigation Draft, 2018)



**Map: HAZUS Flood Results**  
 (Source: Emergency Planning Consultants)

Study Region: Contra Costa County Description: Flood  
 Scenario: 100 Year Flood



**HAZUS Flood Results**

City of Clayton Boundary



Census Blocks



Flood Boundary



100 yr Flood

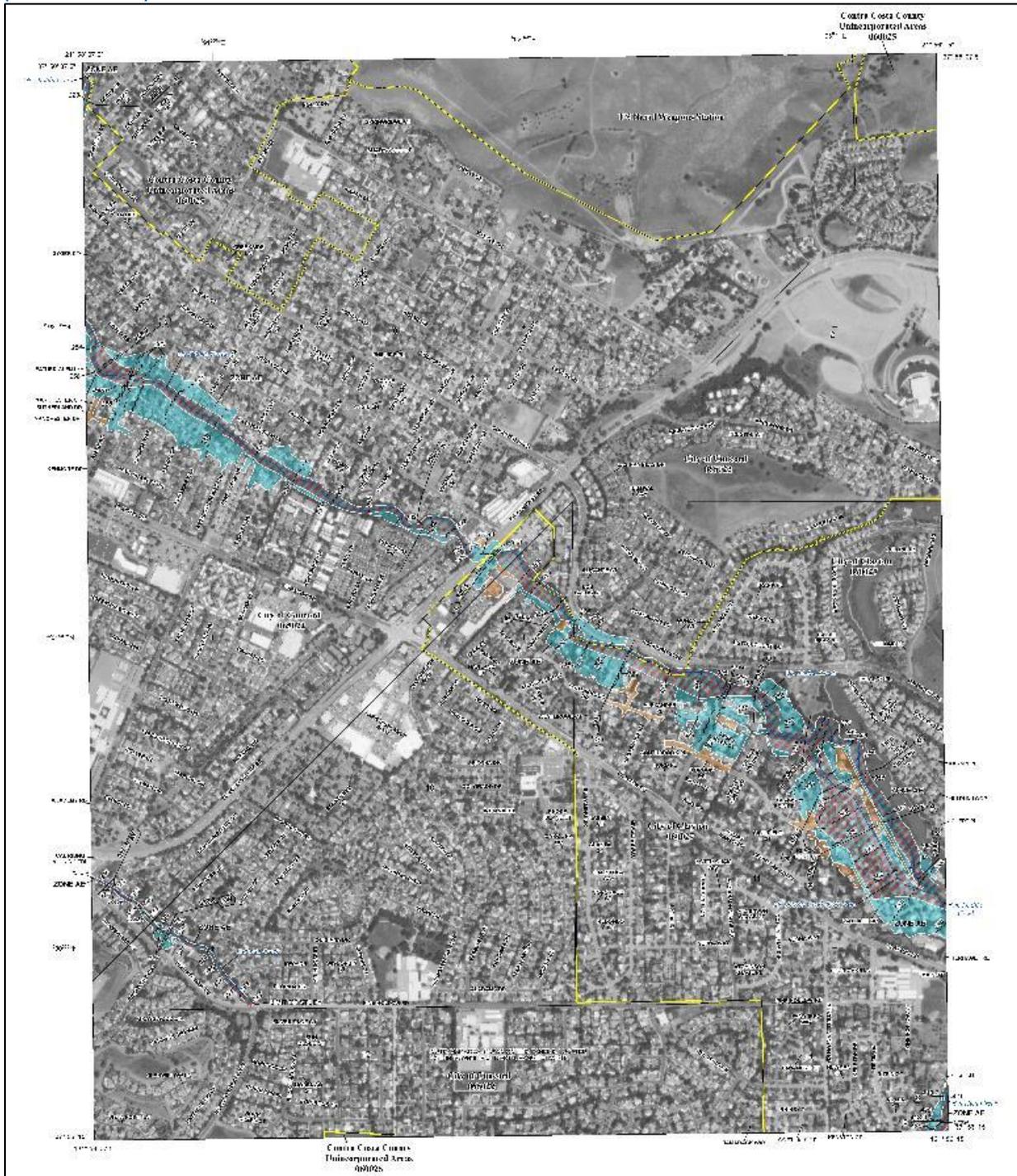


Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGIS, © OpenStreetMap contributors, and the GIS User Community





**Map: National Flood Hazard Layer FIRM Map, City of Clayton  
 (Source: FEMA)**



## 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 Maps as shown in the maps below. 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.

### Atmospheric Rivers

According to the National Oceanic and Atmospheric Administration (NOAA), atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. These columns of vapor move with the weather, carrying an amount of water vapor roughly equivalent to the average flow of water at the mouth of the Mississippi River. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow.

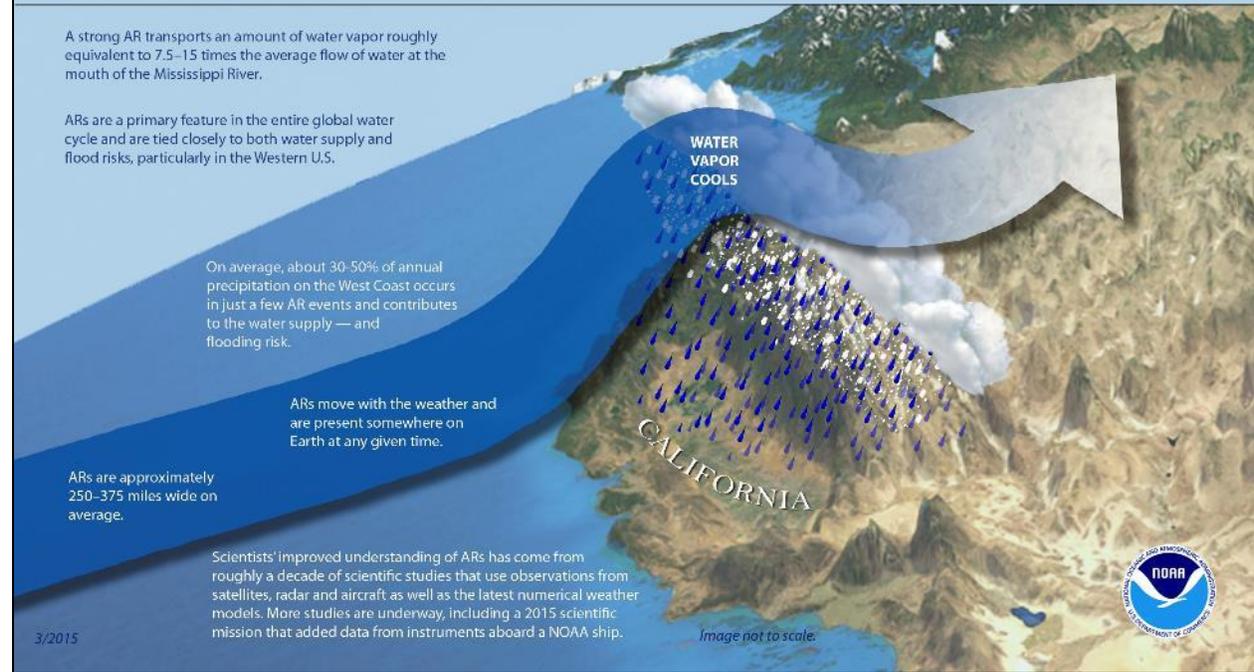


Although atmospheric rivers come in many shapes and sizes, those that contain the largest amounts of water vapor and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. These events can disrupt travel, induce mudslides, and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that can bring moisture from the tropics near Hawaii over to the U.S. West Coast.

Graphic: Atmospheric Rivers  
(Source: National Oceanic and Atmospheric Administration)

## The science behind atmospheric rivers

An atmospheric river (AR) is a flowing column of condensed water vapor in the atmosphere responsible for producing significant levels of rain and snow, especially in the Western United States. When ARs move inland and sweep over the mountains, the water vapor rises and cools to create heavy precipitation. Though many ARs are weak systems that simply provide beneficial rain or snow, some of the larger, more powerful ARs can create extreme rainfall and floods capable of disrupting travel, inducing mudslides and causing catastrophic damage to life and property. Visit [www.research.noaa.gov](http://www.research.noaa.gov) to learn more.



A strong AR transports an amount of water vapor roughly equivalent to 7.5–15 times the average flow of water at the mouth of the Mississippi River.

ARs are a primary feature in the entire global water cycle and are tied closely to both water supply and flood risks, particularly in the Western U.S.

On average, about 30–50% of annual precipitation on the West Coast occurs in just a few AR events and contributes to the water supply — and flooding risk.

ARs move with the weather and are present somewhere on Earth at any given time.

ARs are approximately 250–375 miles wide on average.

Scientists' improved understanding of ARs has come from roughly a decade of scientific studies that use observations from satellites, radar and aircraft as well as the latest numerical weather models. More studies are underway, including a 2015 scientific mission that added data from instruments aboard a NOAA ship.

Image not to scale.



3/2015

While atmospheric rivers are responsible for great quantities of rain that can produce flooding, they also contribute to beneficial increases in snowpack. A series of atmospheric rivers fueled the strong winter storms that battered the U.S. West Coast from western Washington to southern California from December 10–22, 2010, producing 11 to 25 inches of rain in certain areas. These rivers also contributed to the snowpack in the Sierras, which received 75 percent of its annual snow by December 22, the first full day of winter.

NOAA research (e.g., [NOAA Hydrometeorological Testbed](#) and Cal Water) uses satellite, radar, aircraft and other observations, as well as major numerical weather model improvements, to better understand atmospheric rivers and their importance to both weather and climate.

### ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

#### 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** below.

## Impact of Flooding

Floods and their impacts vary by location and severity of any given flood event, and likely only affect certain areas of the region during specific times. Based on the risk assessment, flooding may impact the City. Impacts that are not quantified, but 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 citizens as temporary facilities and relocations would likely be needed.

### *Impacts of Climate Change on Flooding*

Climate change could result in an increase in flooding due to changes in the frequency, duration and intensity of storm events. Rising snowlines caused by climate change will allow additional mountain areas to contribute to peak storm runoff. High frequency flood events (e.g. 10-year floods) will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns.

As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts. As hydrology changes, what is currently considered a 100-year flood may occur more often, leaving many communities at greater risk.

As peak flows and precipitation change over time, planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, floodways, bypass channels and levees, as well as the design of local sewers and storm drains. Use of historical data has long been the standard of practice for designing and operating flood protection projects, developing flood forecasting models, and forecasting snowmelt runoff. The use of past data for forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the historical hydrologic record cannot be used to predict increases in the frequency and severity of extreme events such as floods and droughts. National resource managers have concluded the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management and ecosystem functions.
- Extreme climate events will become more frequent, necessitating improvement in flood protection, drought preparedness and emergency response.

In light of these conclusions, model calibration or statistical relation development in the future must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted

# Landslide Hazards

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## Hazard Definition

The U.S. Geological Survey definition of landslides includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors. Landslides and mudslides can be initiated by storms, earthquakes, fires, volcanic eruptions or human modification of the land. When landslides occur—in response to such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support—they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, breaking of underground pipes, or overriding of downslope property and structures. They can move rapidly down slopes or through channels and can strike with little or no warning at avalanche speeds, posing a serious hazard to properties on or below hillsides. The USGS defines land subsidence as the loss of surface elevation due to the removal of subsurface support. In California, the two principal causes for land subsidence are aquifer compaction due to excessive groundwater pumping and decomposition of wetland soils exposed to air after wetland conversion to farmland.

### **Landslide Types (Source: 2018 Contra Costa County Hazard Mitigation Plan)**

Landslides are commonly categorized by the type of initial ground failure. Common types of slides are shown on Figures below. The most common is the shallow colluvial slide, occurring particularly in response to intense, short-duration storms. The largest and most destructive are deep-seated slides, although they are less common than other types.

Mudslides (or debris flows) are rivers of rock, earth, organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud.

A debris avalanche is a fast-moving debris flow that travels faster than about 10 miles per hour (mph). Speeds in excess of 20 mph are not uncommon, and speeds in excess of 100 mph, although rare, can occur. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water due to the mass of material included in them. They can be among the most destructive events in nature.

Landslides also include the following:

- Rock Falls—blocks of rock that fall away from a bedrock unit without a rotational component
- Rock Topples—blocks of rock that fall away from a bedrock unit with a rotational component
- Rotational Slumps—blocks of fine-grained sediment that rotate and move down slope
- Transitional Slides—sediments that move along a flat surface without a rotational component
- Earth Flows—fine-grained sediments that flow downhill and typically form a fan structure
- Creep—a slow-moving landslide often only noticed through crooked trees and disturbed structures
- Block Slides—blocks of rock that slide along a slip plane as a unit down a slope.

### Warning Signs

The current standard operating procedure is to monitor situations on a case-by-case basis and respond after the event has occurred. Generally accepted warning signs for landslide activity include the following:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations
- Ancillary structures such as decks and patios tilting and/or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped roadbeds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity (soil content)
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows, and visible open spaces indicating jambs and frames out of plumb
- A faint rumbling sound that increases in volume as the landslide nears
- Unusual sounds, such as trees cracking or boulders knocking together

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2**

Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**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 Landslides** below.

### Previous Occurrences of Landslides in Clayton

According to the California Department of Conservation 2021 Seismic Hazard Zone Report for Clayton 7.5 minute Quadrangle, there is a history of soil and geologic conditions that have resulted in landslides. **Table: Seismic Hazard Zones** shows the earthquake-induced landslide areas are immediately adjacent to the City’s boundaries to the south and east.

The Seismic Hazard Zone Report identifies a total of 548 landslides were identified in the landslide inventory, covering about 17 percent of the uplands of the Clayton Quadrangle, or approximately 25 square kilometers (10 square miles). There are no historic landslides in the Clayton Quadrangle. All landslides in the inventory are instead classified as dormant-young or dormant-mature, consisting of 461 rockslides, 271 earth flows, 58 debris fans, 34 debris slides, and 4 debris flows. As the dip of strata generally exceeds the slope inclination, dip-slope landslides are not common. Rather, a primary controlling factor seems to be the differing geologic units and steepness of slopes. Landslides appear to occur where slopes are steeper with higher relief, and generally increase in size and frequency from west to east in the map area.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1**

Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

**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.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

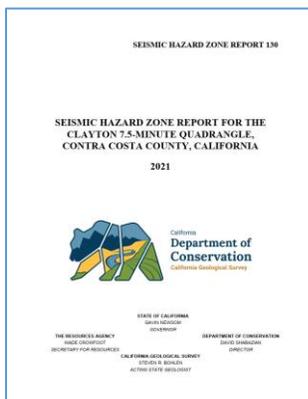
Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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



California Department of Conservation 2021 Seismic Hazard Zone Report for Clayton 7.5 minute Quadrangle includes the City of Clayton, part of the City of Concord, a very small part of the City of Pittsburg and City of Walnut Creek, and unincorporated Contra Costa County. The report states that The amount of area designated as EZRI for earthquake-induced landslides within the Clayton Quadrangle is approximately 63 square kilometers (24 square miles). These zones are prominent around Mt. Diablo and on the side slopes of many moderate to steep ridges in the map area and generally increase in frequency and size towards the southern and northeastern parts of the Clayton Quadrangle.

City, county, and state agencies are required by the California Seismic Hazards Mapping Act to use the Seismic Hazard Zone maps in their land-use planning and permitting processes. They must withhold building permits for sites being developed within Earthquake Zones of Required Investigation (EZRI) until the geologic and soil conditions of the project site are investigated and appropriate mitigation measures, if any, are incorporated into development plans. The Act also requires sellers of real property within these zones to disclose that fact at the time such property is sold.

The structural framework of the Clayton Quadrangle is governed by the geologic processes that created Mount Diablo. This area falls within in a tectonically active region associated with movement of the Mendocino Triple Junction along the boundary of the Pacific and North American plates. The Mendocino Triple Junction passed the latitude of Mount Diablo about 10 million years ago, generating a change from a convergent to a strike slip plate boundary margin. The two plates are currently moving past each other in a right lateral sense at the rate of about 4.8 centimeters per year (Petersen and others, 1996).

Following is the EZRI map depicting the location of liquefaction and earthquake-induced landslide areas:

**Map: Seismic Hazard Zones (blue=EQ-induced landslide, green=liquefaction)**  
(Source: California Department of Conservation)



According to the Clayton General Plan Safety Element (2000), the undeveloped regions of Clayton contain a number of potential geological hazards. These include slopes with unstable expansive soil, high erosion potential, evidence of springs, mudflow potential, rockslide potential

and evidence of significant creep. While landslides may occur on slopes of 15% or less in unstable areas, the risk increases with steepness of slopes. Areas of old slide deposits are most subject to continued failure. Grading without engineered requirements tends to reduce slope stability so that road cuts and the cut-and-fill pads typically prepared for hillside housing carry a greater risk of slope failure than undisturbed hillsides. However, fill slopes engineered to today's standards may result in a more stable situation than in nature, particularly where smaller slide deposits are improved or arrested. Level to 15% slopes may be found in the downtown Clayton area, and to the area immediately northeast of Clayton Road. Much of this area lies on alluvial-type soil, which can amplify ground shaking. The seismic activity possible from area faults and the reaction of alluvial soils should be considered and studied in detail for any proposed development in these areas.

The foothill areas of Clayton contain slope stability problems which may be triggered by improper grading. In addition, foothill areas may experience local slope erosion, sedimentation or drainage problems, expansive soil reaction and other development limitations requiring corrective measures prior to any grading or construction. Ground rupture or slides along the general existing or suspected fault lines is also a possibility. In slope areas greater than 15%, density should remain low. Development should be restricted by City policy for major slope areas in excess of 26%. Some development and slope correction will be permitted on slopes over 26% within the Keller Ranch and within the Marsh Creek Road Specific Plan areas subject to site-specific city review and the demonstration that such development is in conformity with any Specific Plan or other detailed conditions developed for the subject area, the development is not visible when viewed from developed portions of the City or from major road corridors, development does not intrude on the visual integrity of Mt. Diablo, and the development does not displace any sensitive plant or animal species, riparian corridors or wetlands. In no case will development be allowed on slopes in excess of 40%.

The General Plan Safety Element goes on to state that the probability of an earthquake originating in Contra Costa County that is "felt indoors" is low to intermediate. Solid ground or rock tends to lessen ground motion due to earthquakes, while poorly consolidated or water-saturated soils tend to amplify it. The probability of earthquake effect must be measured against the bedrock and soils outlined above. Areas sitting on hard bedrock, such as the Mt. Diablo range, can be expected to perform satisfactorily under earthquake conditions, except where steep slopes, exposed or sheared surfaces and relatively unconsolidated soils might make slumping or landslides possible. The potential for physical effects is more highly probable as a result of earthquakes originating outside the County.

### **Landslide Causes**

Mass movements are caused by a combination of geological and climate conditions, as well as encroaching urbanization. Vulnerable natural conditions are affected by residential, agricultural, commercial, and industrial development and the infrastructure that supports it. The following factors can contribute to landslide:

- Change in slope of the terrain
- Increased load on the land, shocks and vibrations
- Change in water content
- Groundwater movement
- Frost action
- Weathering of rocks
- Removing or changing the type of vegetation covering slopes.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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 Landslides** below.

## Impact of Landslides

Based on the risk assessment, it is evident that earthquakes will continue to have potentially devastating economic impacts to the project area. 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 citizens as temporary facilities and relocations would likely be needed.

### *Impacts of Climate Change on Landslides*

Climate change has and will continue to impact storm patterns in California. This changing of the hydrograph means that the probability of more frequent, intense storms with varying duration will increase. Increase in global temperature will also affect the snowpack and its ability to hold and store water. Additionally, warming temperatures will increase the occurrence and duration of droughts, which will increase the probability of wildfire, which impacts the vegetation that helps to support steep slopes. All of these factors working in unison would increase the probability for landslide occurrences in the planning area.

# Epidemic/Pandemic/Vector-Borne Disease Hazards

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## Hazard Definition

According to the California State Hazard Mitigation Plan (2018), the California Department of Public Health has identified epidemics, pandemics, and vector-borne diseases as specific hazards that would have a significant impact throughout the State.

According to the Centers for Disease Control (CDC), an epidemic refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population area. A pandemic refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people. Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors – living organisms that can transmit infectious pathogens between humans, or from animals to humans.



## Seasonal Influenza

Seasonal influenza, also known as the flu, is a disease that attacks the respiratory system (nose, throat, and lungs) in humans. Seasonal influenza occurs every year. In the U.S., the influenza season typically occurs from October through May, peaking in January or February with yearly epidemics of varying severity. Although mild cases may be similar to a viral “cold,” influenza is typically much more severe. Influenza usually comes on suddenly; may include fever, headache, tiredness (which may be extreme), dry cough, sore throat, nasal congestion, and body aches; and can result in complications such as pneumonia. Persons aged 65 and older, those with chronic health conditions, pregnant women, and young children are at the highest risk for serious complications, including death.

## Pandemic Influenza

A pandemic influenza occurs when a new influenza virus, for which there is little or no human immunity, emerges and spreads on a worldwide scale, infecting a large proportion of the human population. The 20th century saw three such pandemics. The most notable pandemic was the 1918 Spanish influenza pandemic that was responsible for 20 million to 40 million deaths throughout the world. There have been two pandemics in the 21<sup>st</sup> century; H1N1 in 2009, and the most recent COVID-19 outbreak in 2019. As demonstrated historically and currently, pandemic influenza has the potential to cause serious illness and death among people of all age groups and have a major impact on society. These societal impacts include significant economic

disruption that can occur due to death, loss of employee work time, and costs of treating or preventing the spread of influenza.

### *H1N1 Influenza*

In 2009 a pandemic of H1N1 influenza, popularly referred to as the swine flu, resulted in many hospitalizations and deaths. Pandemic H1N1 influenza is spread in the same way as seasonal influenza, from person to person through coughing or sneezing by infected people. In April 2009, two kids living more than 100 miles apart in Southern California came down with the flu. By mid-April, their illnesses had been diagnosed as being caused by a new strain of H1N1 influenza. Persons infected with H1N1 experienced fever and mild respiratory symptoms, such as coughing, runny nose, and congestion. In some cases, symptoms were severe and included diarrhea, chills, and vomiting, and in rare cases respiratory failure occurred. The H1N1 virus caused relatively few deaths in humans. In the United States, for example, it caused fewer deaths (between 8,870 and 18,300) than seasonal influenza, which, based on data for the years 2014–2019, causes an average of about 40,000 deaths each year. The H1N1 virus was most lethal in individuals affected by chronic disease or other underlying health conditions.

### *COVID-19*

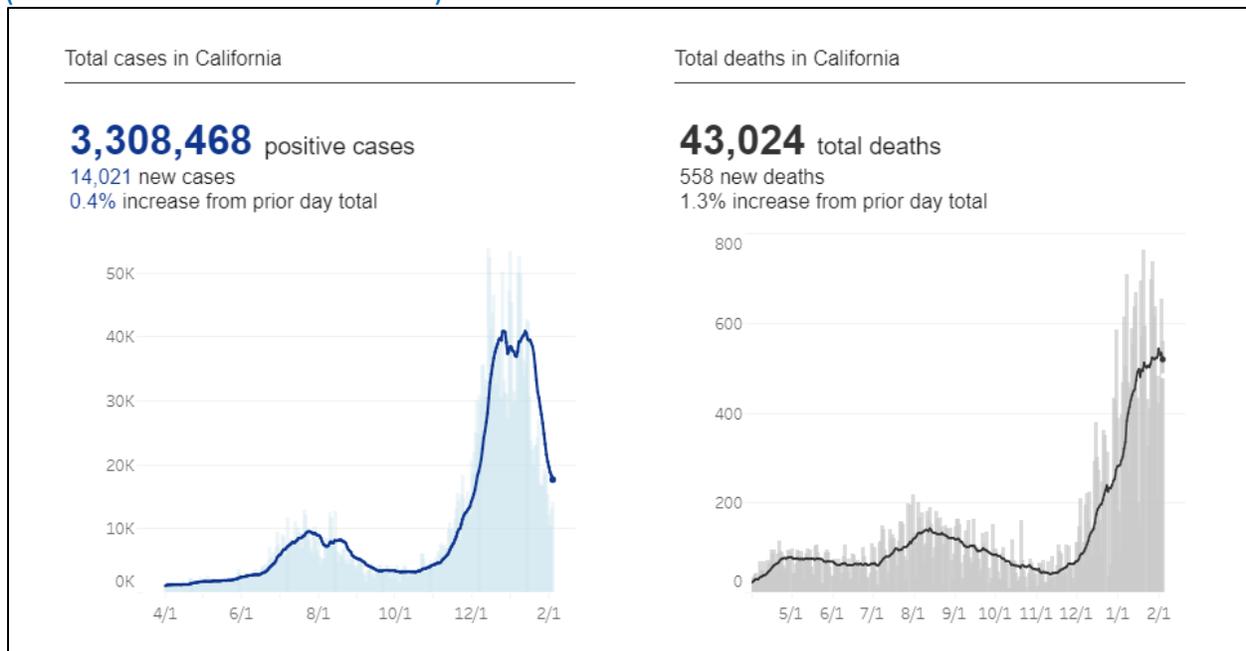
Beginning in 2019, the U.S. Centers for Disease Control responded to a pandemic of respiratory disease spreading from person to person caused by a novel (new) coronavirus. The disease was named “Coronavirus Disease 2019” (abbreviated “COVID-19”). Coronaviruses are a large family of viruses that are common in people and many different species of animals, including camels, cattle, cats, and bats. Rarely, animal coronaviruses can infect people and then spread between people such as with Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).

According to the CDC, many of the patients at the epicenter of the outbreak in Wuhan, Hubei Province, China had some link to a large seafood and live animal market, suggesting animal-to-person spread. Later, a growing number of patients reportedly did not have exposure to animal markets, indicating person-to-person spread. Person-to-person spread was subsequently reported outside Hubei and in countries outside China, including in the United States. Most international destinations now have ongoing community spread with the virus that causes COVID-19, as does the United States.

On March 4, 2020, Governor Newsom proclaimed a state of emergency in the California in response to the COVID-19 outbreak. On March 19, 2020, Governor Newsom issued an executive order directing all residents immediately to heed current State public health directives to stay home, except as needed to maintain continuity of operations of essential critical infrastructure sectors.



**Graphic: Total Cases and Deaths in California**  
(California State Government Website)



### Avian Influenza

Avian Influenza, commonly referred to as “Bird Flu,” remains a looming pandemic threat. Avian Influenza primarily spreads from birds to birds and rarely to humans. Public health experts continue to be alert to the possibility that an avian virus may mutate or change so that it can be passed from birds to humans, potentially causing a pandemic in humans. Some strains of the Avian Influenza could arise from Asia or other continents where people have very close contact with infected birds. This disease could have spread from poultry farmers or visitors to live poultry markets who had been in very close contact with infected birds and contracted fatal strains of Avian Influenza. Thus far, Avian Influenza viruses have not mutated and have not demonstrated easy transmission from person to person. However, if Avian Influenza viruses were to mutate into a highly virulent form and become easily transmissible from person to person, the public health community would be very concerned about the potential for an influenza pandemic. Such a pandemic could disrupt all aspects of society and severely affect the economy.

## Vector-Borne Diseases

Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors. Every year there are more than 700,000 deaths from diseases such as malaria, dengue, schistosomiasis, human African trypanosomiasis, leishmaniasis, Chagas disease, yellow fever, Japanese encephalitis and onchocerciasis. Vectors are living organisms that can transmit infectious pathogens between humans, or from animals to humans. Many of these vectors are bloodsucking insects, which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later transmit it into a new host, after the pathogen has replicated. Often, once a vector becomes infectious, they can transmit the pathogen for the rest of their life during each subsequent bite/blood meal.



## Mosquito-Borne Viruses

Mosquito-borne viruses belong to a group of viruses commonly referred to as arboviruses (for arthropod-borne). Although 12 mosquito-borne viruses are known to occur in California, only West Nile virus (WNV), western equine encephalomyelitis virus (WEE), and St. Louis encephalitis virus (SLE) are significant causes of human disease. WNV continues to seriously affect the health of humans, horses, and wild birds throughout the state. Since 2003, there have been over 6,000 WNV human cases with 248 deaths, and over 1,200 equine cases.

WNV first appeared in the United States in 1999 in New York and rapidly spread across the country to California in subsequent years. California has historically maintained a comprehensive mosquito-borne disease surveillance and control program including the Mosquito-borne Virus Surveillance and Response Plan, which is updated annually in consultation with local vector control agencies.

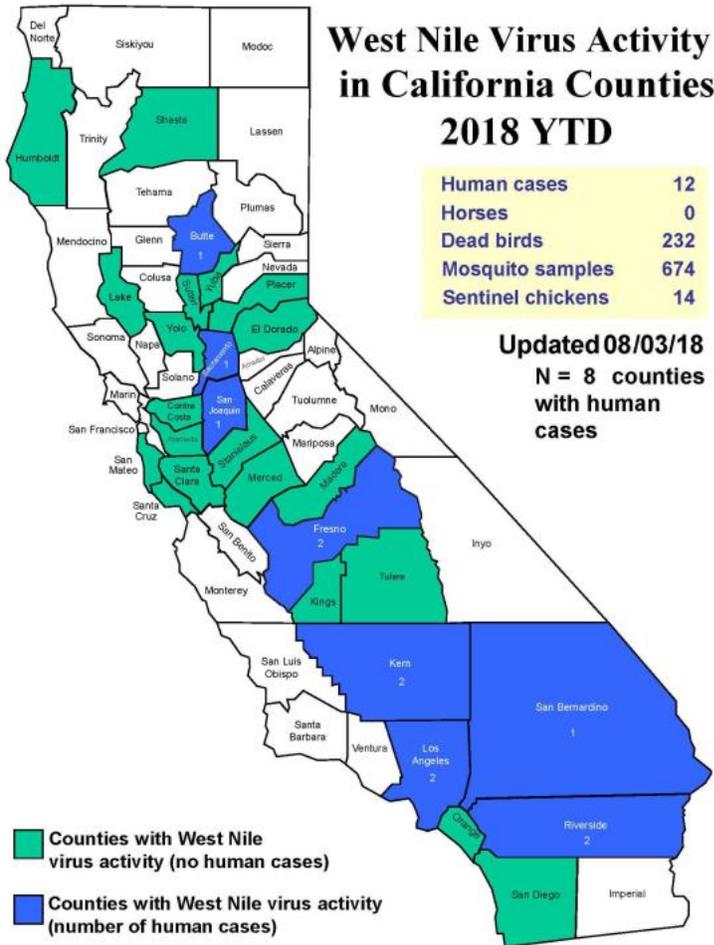
Climate change will likely affect vector-borne disease transmission patterns. Changes in temperature and precipitation can influence seasonality, distribution, and prevalence of vector-borne diseases. A changing climate may also create conditions favorable for the establishment of invasive mosquito vectors in California.

For most Californians, WNV poses the greatest mosquito-borne disease threat. Above-normal temperatures are among the most consistent factors associated with WNV outbreaks. Mild winters are associated with increased WNV transmission due, in part, to less mosquito and resident bird mortality. Warmer winter and spring seasons may also allow for transmission to start earlier. Such conditions also allow more time for virus amplification in bird-mosquito cycles, increasing the potential for mosquitoes to transmit WNV to people.

The effects of increased temperature are primarily through acceleration of physiological processes within mosquitoes, resulting in faster larval development and shorter generation times, more frequent mosquito biting, and shortening of the incubation period time required for infected mosquitoes to transmit WNV. During periods of drought, especially in urban areas, mosquitoes tend to thrive more due to changes in stormwater management practices. Mosquitoes in urban areas can reach higher abundance due to stagnation of water in underground stormwater systems that would otherwise be flushed by rainfall. Runoff from landscape irrigation systems mixed with

organic matter can also create ideal mosquito habitat. Drought conditions may also force birds to increase their utilization of suburban areas where water is more available, bringing these WNV hosts into contact with urban vectors.

**Map: West Nile Virus Activity in California Counties**  
(Source: California State Hazard Mitigation Plan, 2018)



### Lyme Disease

Lyme disease is caused by a spirochete (a corkscrew-shaped bacteria) called *Borrelia burgdorferi* and is transmitted by the Western black-legged tick. Lyme disease was first described in North America in the 1970s in Lyme, Connecticut, the town for which it was then named. Though the tick has been reported from 56 of the 58 counties in California, the highest incidence of disease occurs in the northwest coastal counties and northern Sierra Nevada counties with western-facing slopes. Ticks prefer cool, moist areas and can be found in wild grasses and low vegetation in both urban and rural areas.

The map below shows Western black-legged tick and Lyme disease incidence in California. The Western black-legged tick is commonly found in all green areas shown on the map; dark green areas on the map show where reported Lyme disease cases most often had exposure.

**Map: Tick and Lyme Disease Incidence in California**  
 (Source: California State Hazard Mitigation Plan, 2018)



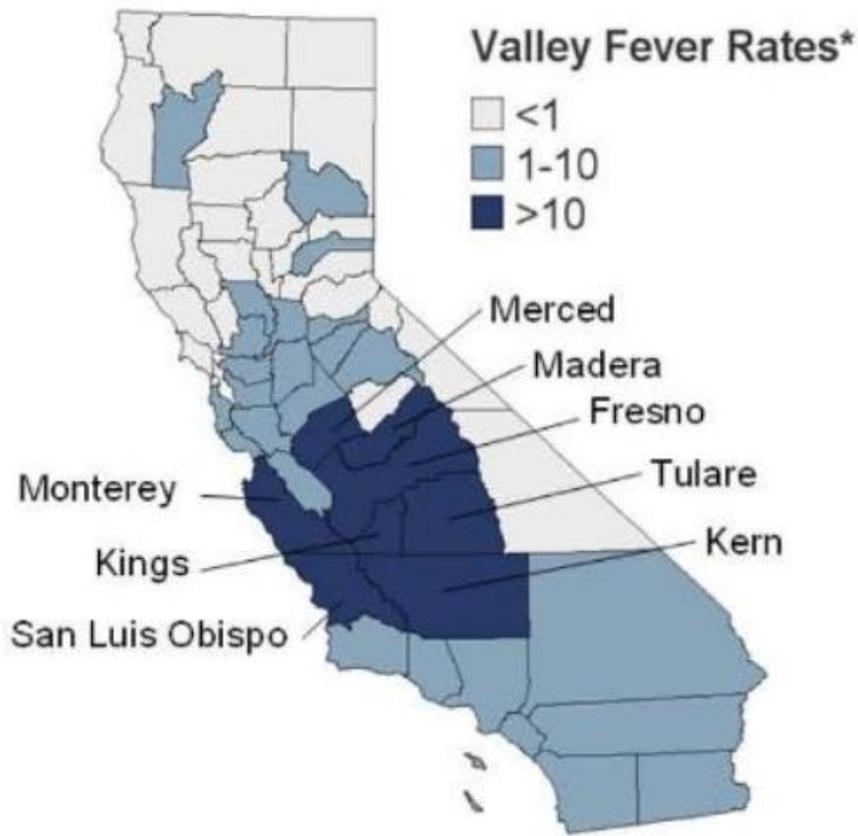
*Valley Fever*

Valley Fever is caused by *Coccidioides*, a fungus that lives in the soil in the southwestern United States and parts of Mexico, Central America, and South America. Inhaling the airborne fungal spores can cause an infection called coccidioidomycosis, which is also known as “cocci” or “Valley Fever.”

Most people who are exposed to the fungus do not get sick, but some people develop flu-like symptoms that may last for weeks to months. In a very small proportion of people who get Valley Fever, the infection can spread from the lungs to other parts of the body and cause more severe conditions, such as meningitis or even death. Valley Fever cannot spread from person to person.

Most cases of Valley Fever in the U.S. occur in people who live in or have traveled to the southwestern United States, especially Arizona and California. The map below shows the areas where the fungus that causes Valley Fever is thought to be endemic, or native and common in the environment. The full extent of the current endemic areas is unknown and is a subject for further study

Map: Valley Fever Average Annual Rates by California County  
 (Source: California State Hazard Mitigation Plan, 2018)



\*Average of annual rates from 2008-2012 per 100,000 population

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2**

Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**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 Epidemic/Pandemic/Vector-Borne Diseases** below.

## Previous Occurrences of Epidemic/Pandemic/Vector-Borne Disease

The County has experienced public health hazards detailed in the table below. The most recent events occurred between 2011-2015, when the County was impacted by 1 case of Hantavirus and 18 cases of Lyme Disease.

**Table: Past Events of Public Health Hazards, Contra Costa County**  
 (Source: Contra Costa County Hazard Mitigation Plan, 2018)

Dates	Type	Impact
2011-2015	Hantavirus	1 case in the county
2011-2015	Lyme Disease	18 cases
April 2009-August 2010	H1N1	54 confirmed cases, with 12 deaths due to the illness
2004	West Nile Virus	39 people have been diagnosed with the virus since 2004 and two people have died

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1**

Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

**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.

**ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3**

Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**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

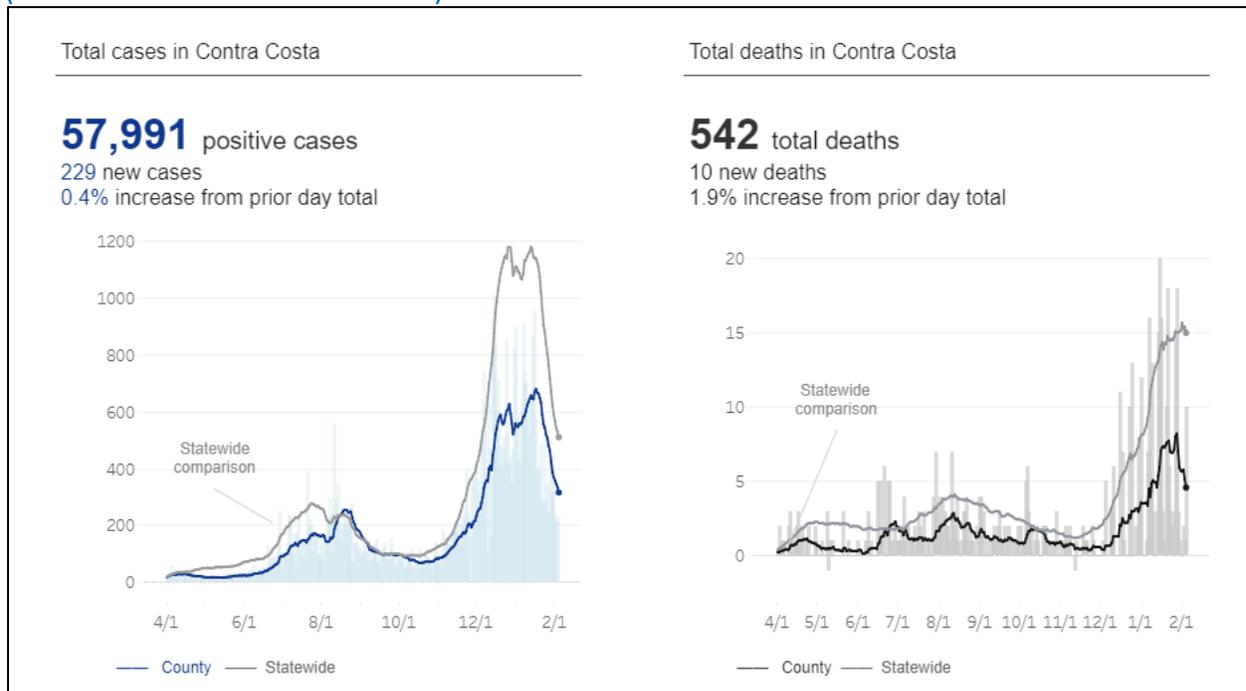
As of February 2021, Contra Costa County remains designated as a widespread risk level. The County experiences 31.4 new COVID-19 cases per day per 100,000 people with a 7% positivity rate. The County has 57,991 positive cases with 542 total deaths.

According to the Contra Costa County Hazard Mitigation Plan (2018), while some hazards, such as the West Nile Virus and Lyme Disease, can have a geographic presence within the planning area, other diseases can cause exposure to the planning area from outside the local region. Local residents who travel can become exposed to diseases while abroad and bring the diseases back with them, potentially placing the region at risk for exposure.

Due to increased air travel and growing population, the probability of a communicable disease epidemic is a growing threat. Certain human health hazards, such as influenza, can be expected seasonably, with variations on specific strains year to year. Additionally, tick-borne diseases are likely to increase during spring and fall, when people participate in outdoor activities such as hiking. The frequency of other health hazards is difficult to establish and depends largely on the unique circumstances surrounding a localized outbreak and its subsequent expansion into epidemics.

The severity of the human health hazard varies from individual to individual. Typically, young children and older adults are more susceptible to acquiring communicable diseases due to developing or diminishing immune systems or experiencing adverse effects from extreme weather conditions. These populations often experience the most severe of symptoms, as their immune systems are not capable of fighting off infection or efficiently regulating temperature. In general, severity varies depending on the pathology of the disease, the health of the infected, and the availability of treatments for alleviating symptoms or curing the disease.

**Graphic: Total Cases and Deaths in Contra Costa County (California State Government Website)**



<b>ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B3</b>
Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))
<b>Q&amp;A   ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT   B3a</b>
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))
<b>A: See <i>Impact of Epidemic/Pandemic/Vector-Borne Diseases</i> below.</b>

## Impact of Epidemic/Pandemic/Vector-Borne Diseases

Based on the risk assessment, it is evident that Epidemic/Pandemic/Vector-Borne Diseases will continue to have potentially devastating economic impacts to the City. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Disruption of public infrastructure
- ✓ Disruption of the educational process
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Closure of businesses and public services
- ✓ Reduction of transportation services

### *Impacts of Climate Change on Epidemic/Pandemic and Vector-Borne Diseases*

According to California’s Fourth Climate Change Assessment (2019), climate influences the population size, geographic distribution, and reproduction of vectors (rodents, mosquitoes, ticks, fleas, and others) that transmit diseases to humans. The many factors that contribute to the incidence of vector-borne diseases—such as land use patterns and human behavior present challenges in projecting their spread.

Long-term climate change creates a variety of direct and indirect threats to human health, but with geographic variability impacting the severity of each threat. Ekstrom and Moser (2012) outlined the threats for the San Francisco Bay area due to increased frequency and magnitude of extreme heat events, changes in precipitation (including both more intense events and the potential for longer and deeper droughts), and long-term sea level rise. Indirect effects of climate change on human health arise from connections of climate and weather conditions with health responses. Examples include air pollution, pollen and allergens, water quality and harmful algal blooms, disease vectors (insects and rodents), and supply of water and food. As climate change transforms conditions for each of these elements, threats to human health emerge. In aggregate, if conditions deteriorate in a region or subregion, human migration will follow, as people seek new homes that can better support their health and well-being.

# PART III: MITIGATION STRATEGIES

## ELEMENT C: MITIGATION STRATEGY | C4

Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))

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

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

**A:** See **Mitigation Strategies** 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 Strategies** below.

## Mitigation Strategies

### Overview of Mitigation Strategy

As the cost of damage from disasters continues to increase nationwide, the City 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 at City facilities.

The plan provides a set of action items to reduce risk from hazards through education and outreach programs, and to foster the development of partnerships. Further, the plan provides for the implementation of preventative activities.

The resources and information within the Mitigation Plan:

1. Establish a basis for coordination and collaboration among agencies and the public in the City
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 plans including the City’s General Plan and Capital Improvement Program 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 reviewed the goals from the 2011 ABAG Multi-Jurisdictional Hazard Mitigation Plan. Goals were revised based on the results of a more specific risk assessment and tempered by the needs of the community.

Each of the following goals 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.

### *Increase 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.

### *Protect 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.

### *Promote Partnerships and Implementation*

Strengthen communication and coordinate participation with public agencies, riders, 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.

### *Enhance 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.

## **How are the Mitigation Action Items Organized?**

### *Mitigation Action Item*

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:

### *Assigned Department/Division*

The Mitigation Actions Matrix assigns primary responsibility for each of the action items. The hierarchies of the assignments vary – from positions to departments to committees. The primary responsibility for implementing the action items falls to the entity shown as the “Assigned Department/Division”. The assigned entity 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.

### *Timeline*

The mitigation plan should be updated every 5-years according to FEMA regulations. However, there are projects and programs in the Mitigation Actions Matrix that will require more than 5-years to complete.

### *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

### *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 Program, 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 2007 and was used as a resource throughout the Mitigation Plan. The next General Plan update will likely not take place for another 10 years.

The Capital Improvement Program (CIP), 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.

<b>ELEMENT C: MITIGATION STRATEGY   C4</b>
Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C4c.</b>
<b>Q:</b> Do the identified mitigation actions and projects have an emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))
<b>A:</b> See <b>Building and Infrastructure</b> below.

### *Building and 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.

<b>ELEMENT C: MITIGATION STRATEGY   C5</b>
Does the plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C5a.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Benefit/Cost Ratings</b> below.

### *Benefit/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.

<b>ELEMENT C: MITIGATION STRATEGY   C5</b>
Does the plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C5a.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Priority Rating</b> below.

### *Priority Rating*

The Planning Team utilized the following Priority Rating method. Designations of “High”, “Medium”, and “Low” priority have been assigned to all of the action items 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

**ELEMENT C: MITIGATION STRATEGY | C1**

Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

**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))

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

**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 **Mitigation Actions Matrix** below.

**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 **Mitigation Actions Matrix** below.

**ELEMENT C: MITIGATION STRATEGY | C4**

Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))

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

**Q:** a. Does the plan identify and analyze a comprehensive range 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.

**ELEMENT C: MITIGATION STRATEGY | C5**

Does the plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

**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 | E ELEMENT C: MITIGATION STRATEGY | C5b.**

**Q:** Does the plan identify the position, office, department, or agency responsible for implementing and administering the action, 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.

**ELEMENT C: MITIGATION STRATEGY | C6**

Does the plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))

**Q&A | ELEMENT C: MITIGATION STRATEGY | C6c.**

**Q:** The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. (Requirement §201.6(c)(4)(ii))

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



## Mitigation Actions Matrix

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

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
<b>Multi-Hazard Action Items</b>														
<i>Note: Several action items were removed from the 2011 actions list because they were not considered economically feasible or did not relate directly to mitigation.</i>														
MH-1 Install EV Chargers for public use at City facilities.	City Manager	1-5		X	X		X	Yes	B, CIP, HMGP, PDM, BRIC	B	H	H	H	New
MH-2 Upgrade and implement energy efficient lighting systems at City facilities.	City Manager	1-5		X	X		X	Yes	B, CIP, HMGP, PDM, BRIC	B	H	H	H	Revised

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
MH-3 Conduct comprehensive energy audit and assess recommendations.	City Manager	1-5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B	H	H	H	Revised
MH-4 Increase the average fuel efficiency of municipal fleet through addition of alternative fuel vehicles.	Maintenance Services	1-5	X	X	X	X	X	No	B, CIP, HMGP, PDM, BRIC	B	H	H	H	Revised
MH-5 Launch an employee education program including anti-idling messages.	Maintenance Services	1-5	X	X	X	X	X	No	B, CIP, HMGP, PDM, BRIC	B	H	L	H	New
MH-6 Change diesel vehicles to electric and/or CNG vehicles.	Maintenance Services	1-5	X	X	X	X	X	No	B, CIP, HMGP, PDM, BRIC	B	H	H	H	New
MH-7 Implement a GIS system and conduct an inventory of City's existing assets.	Community Development	1-5	X	X	X	X	X	No	B, CIP, HMGP, PDM, BRIC	B	H	H	H	Revised

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
MH-8 Maintain healthy urban forests and promote tree planting to increase shading and absorb CO2.	Community Development	5	X	X	X	X	X	No	B, CIP, HMGP, PDM, BRIC	B	H	L	H	Revised
MH-9 Facilitate and/or coordinate the distribution of mitigation materials prepared by others via community access television and social media.	City Manager	1	X	X	X	X	X	Yes	B	B	H	L	H	Revised
MH-10 Seek funding to purchase and install solar power and backup batteries at all City facilities.	Engineering	1-2	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B	H	H	H	New
MH-11 Design and ultimately construct/install emergency/auxiliary power (generator) to the City Hall complex including City Hall, Corporation Yard and Library building allowing the City to remain functional during a power outage or disaster. (Source: CIP #10447)	Maintenance Services	1-2	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B, CIP	H	M	H	New

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
MH-12 Seek funding to support City's compliance NPDES Municipal Regional Permit (MRP) requirements for local government.	City Manager	1-5	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	H	New
MH-13 Construct modifications to exiting sanitary sewer mains to prevent potential sewer overflows in areas adjacent to Mt. Diablo Creek. (Source: CIP Project # 10422)	City Manager	n/a	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	H	New, Completed
<b>Earthquake Action Items</b>														
EQ-1 Conduct investigation into seismic adequacy of City's Corporate Yard.	Community Development	1-3	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	H	Revised
EQ-2 Conduct investigation into seismic adequacy of City's Library.	Community Development	1-3	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	H	Revised
EQ-3 Conduct investigation into seismic adequacy of historic Keller House.	Community Development	1-3	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	H	Revised

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
<b>Flood Action Items</b>														
FLD-1 Provide sandbags and plastic sheeting to property owners and tenants prior to rainstorms.	Maintenance Services	5	X	X	X	X	X	Yes	B, HMGP, PDM, BRIC	B	H	M	H	Revised
FLD-2 Encourage private business and private property owners to participate in acquisition and relocation programs for areas within floodplains as funding opportunities become available.	Engineering	5	X	X	X	X	X	Yes	B, HMGP, PDM, BRIC	B	H	L	H	Revised
FLD-4 Continue participation in the FEMA National Flood Insurance Program.	Engineering	5	X	X	X	X	X	Yes	B	B	H	L	H	Revised
FLD-5 Conduct watershed analyses of runoff and drainage systems to predict areas of insufficient capacity in the storm drain and natural creek system.	Engineering	5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B	H	L	H	New

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
FLD-6 Keep storm drains and creeks free of obstructions while retaining appropriate vegetation in the channel to allow for the free flow of water.	Maintenance Services	1-5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B	H	H	H	New
FLD-7 Seek funding to support City's compliance NPDES Municipal Regional Permit (MRP) requirements for local government.	City Manager	1-5	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	H	New
FLD-8 Seek funding for stream gauges along Mount Diablo Creek.	City Manager	1-5	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	M	New
FLD-9 Improve drainage flow through pavement resurfacing and treatment on various streets.	City Manager	1-5	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	H	New
FLD-10 Require new development near floodways to incorporate a buffer zone or setback from that floodway to allow for changes in stormwater flows in the watershed over time.	Engineering	5	X	X	X	X	X	Yes	B	B	H	L	H	Revised

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
FLD-11 Clean out debris basin located in GHAD easement behind golf course and single-family lots. (Source: CIP #10343)	Maintenance Services	1-5	X	X	X	X	X	Yes	CIP	CIP	H	M	H	New
FLD-12 Clean out creeks, improve access to creek banks, reinforce creek banks and repair adjacent trails where needed, replace riparian vegetation. (Source: CIP # 10370)	Maintenance Services	1-5	X	X	X	X	X	Yes	CIP	CIP	H	M	H	New
<b>Wildfire Action Items</b>														
WF-1 Manage and enhance the oak/grassland savanna open space parcels citywide. These parcels provide wildfire protection for the City by creating a low-fuel buffer zone between open space and developed neighborhoods. These parcels require management to prevent noxious and invasive plants from invading and taking over the grassland	Engineering	1-5	X	X	X	X	X	Yes	CIP, HMGP, PDM, BRIC	B, CIP	H	H	H	New

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
savanna. Noxious and invasive plants provide higher fuel loading and deplete the buffer protecting developed neighborhoods. (Source: CIP #10446)														
WF-2 Identifying “model” properties within the community and region within the Wildland-Urban Interface area showing defensible space and structural survivability.	Community Development	1-5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B	H	H	H	Revised
WF-3 Continue implementation of defensible space vegetation program.	Maintenance Services	5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B	H	H	H	Revised
WF-4 Install oversized sprinkler in Wildland Urban Interface medians to assist with wildfire response.	Landscape Districts	1-5	X	X	X	X	X	Yes	HMGP, PDM, BRIC	B	H	H	H	New
WF-5 Underground overhead utility lines. (Source: CIP Project #10397)	Engineering	1-5	X	X	X	X	X	Yes	HMGP, PDM,	B, CIP	H	H	H	New

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
									BRIC, PG&E					
<b>Epidemic/Pandemic/Vector-Borne Diseases Action Items</b>														
EPV-1 Establish protocols, facility improvements, city support services, and supplies in the event of an epidemic/pandemic/vector-borne disease.	City Manager	5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B, CIP	H	H	H	New
EPV-2 Distribute public education materials via social media and the City's website that encourage citizens and businesses to prevent and/or minimize the spread of epidemic/pandemic/vector-borne diseases.	City Manager	5	X	X	X	X	X	No	B, CIP, HMGP, PDM, BRIC	B	H	M	H	New
<b>Landslide Action Items</b>														
LND-1 Stabilize and/or repair large slope moving adjacent to single-family houses	Engineering	1-5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B, CIP	H	M	H	New

Mitigation Action Item	Assigned Department/Division	Timeline (years)	Goal: Protect Life and Property	Goal: Enhance Public Awareness	Goal: Protect Natural Systems	Goal: Protect Emergency Services	Goal: Encourage Partnerships	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes, No	Funding Source: B=Budget, CIP=Capital Improvement Program, HMGP=Hazard Mitigation Grant Program, PDM=Pre-Disaster Mitigation, BRIC=Building Resilient Infrastructure and Communities	Planning Mechanism: B=Budget, CIP=Capital Improvement Program	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	Status: Revised, New, Completed
and streets in Eagle Peak Subdivision. (Source: CIP #10347A)														
LND-2 Stabilize and/or repair small slope pop-out in the Keller Ridge Drive Area adjacent to single-family homes. (Source: CIP #10348)	Engineering	1-5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B, CIP	H	M	H	New
LND-3 Repair landslides at Community Park that occurred above field #3 (uppermost field). (Source: CIP # 10349)	Engineering	1-5	X	X	X	X	X	Yes	B, CIP, HMGP, PDM, BRIC	B, CIP	H	M	H	New

# Plan Maintenance

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

## Local Mitigation Officer

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 Planning Team Chair, Reina Schwartz, who will be referred to as the 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 all of 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 no less than annually. 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. The Local Mitigation Officer or designee will be responsible for contacting the Planning Team members and organizing the annual meeting which will take place annually during the month of the Plan’s approval.

<p><b>ELEMENT A: PLANNING PROCESS   A6</b></p> <p>Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))</p> <p><b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6a.</b></p> <p><b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>monitored</b> (how will implementation be tracked) over time? (Requirement §201.6(c)(4)(i))</p> <p><b>A:</b> See <b>Method and Scheduling of Plan Implementation</b> below.</p> <p><b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6c.</b></p> <p><b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>updated</b> during the 5-year cycle? (Requirement §201.6(c)(4)(i))</p> <p><b>A:</b> See <b>Method and Scheduling of Plan Implementation</b> below.</p>
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## Method and Scheduling of Plan Implementation

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

<b>ELEMENT A: PLANNING PROCESS   A6</b>
Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6a.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>monitored</b> (how will implementation be tracked) over time? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Monitoring and Implementing the Plan</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6b.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>evaluated</b> (assessing the effectiveness of the plan at achieving stated purpose and goals) over time? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Monitoring and Implementing the Plan</b> below.

## 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, the City will gain eligibility for Hazard Mitigation Grant Program funds.

<b>ELEMENT A: PLANNING PROCESS   A6</b>
Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6a.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>monitored</b> (how will implementation be tracked) over time? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Monitoring the Plan</b> below.

### Monitoring the Plan

The Local Mitigation Officer will hold an annual meeting with representatives from the assigned department/divisions in order to gather status updates on the mitigation action items. 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 meeting will be on the progress and changes to the Mitigation Action Items.

<b>ELEMENT C: MITIGATION STRATEGY   C1</b>
Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C1b.</b>
<b>Q:</b> Does the plan document each jurisdiction’s ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))
<b>A:</b> See <b>Implementation through Existing Programs</b> below.

<b>ELEMENT C: MITIGATION STRATEGY   C6</b>
Does the plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C6a.</b>
<b>Q:</b> Does the plan identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated? (Requirement §201.6(c)(4)(ii))
<b>A:</b> See <b>Implementation through Existing Programs</b> below.
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C6b.</b>
<b>Q:</b> Does the plan describe each community’s process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms? (Requirement §201.6(c)(4)(ii))
<b>A:</b> See <b>Implementation through Existing Programs</b> below.
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C6c.</b>
<b>Q:</b> The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. (Requirement §201.6(c)(4)(ii))
<b>A:</b> See <b>Implementation through Existing Programs</b> below.

### *Implementation through Existing Programs*

The City addresses statewide planning goals and legislative requirements through the General Fund, Capital Projects, and Grants. 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 will implement recommended mitigation action items through existing programs and procedures.

The City is responsible for adhering to the State of California’s Building and Safety Codes. In addition, the City may work with other agencies at the state level to review, develop and ensure Building and Safety Codes are adequate to mitigate or prevent 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 strategic and other budget documents. The various departments involved in developing the Plan will review it on an annual basis. Upon annual review, the Planning Team will work with the departments to identify areas that the Mitigation Plan action items are consistent

with the strategic and budget documents to ensure the Mitigation Plan goals and action items are implemented in a timely fashion.

Upon FEMA approval, the Planning Team will begin the process of incorporating risk information and mitigation action items into existing planning mechanisms. The annual 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 the City’s planning documents and procedures.

Specifically, the Planning Team will utilize the updates of the following documents to implement the Mitigation Plan:

- ✓ Risk Assessment, City Profile, Planning Process (stakeholders) – Emergency Operations Plan, Long Range Facilities Master Plan
- ✓ Mitigation Actions Matrix – General Fund, Capital Projects, Grants, Bonds

<b>ELEMENT A: PLANNING PROCESS   A6</b>
Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6c.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>updated</b> during the 5-year cycle? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Annual Implementation Report</b> below.

### *Annual Implementation Report*

The Annual Implementation Matrix is the same as the Mitigation Actions Matrix but with a column added 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 Matrix:

An equal 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 to goal achievement and public participation.

<b>ELEMENT C: MITIGATION STRATEGY   C5</b>
Does the plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
<b>Q&amp;A   ELEMENT C: MITIGATION STRATEGY   C5a.</b>
<b>Q:</b> 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))
<b>A:</b> See <b>Economic Analysis of Mitigation Projects</b> and <b>FEMA Benefit-Cost Analysis Guidelines</b> below.

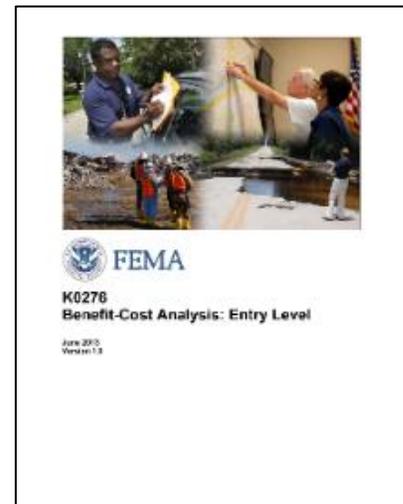
## Economic Analysis of Mitigation Projects

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.

<b>ELEMENT A: PLANNING PROCESS   A6</b>
Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6a.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>monitored</b> (how will implementation be tracked) over time? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Evaluating and Updating the Plan</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6b.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>evaluated</b> (assessing the effectiveness of the plan at achieving stated purpose and goals) over time? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Evaluating and Updating the Plan</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6c.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>updated</b> during the 5-year cycle? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Evaluating and Updating the Plan</b> below.

## Evaluating and Updating the Plan

### Evaluation

At the conclusion of the Annual Implementation Meeting, the Local Mitigation Officer will lead a discussion with the Planning Team on the success (or failure) of the Mitigation Plan to meet the plan goals. The results of that discussion will be added to the Evaluation portion of the Annual Implementation Report and inclusion in the 5-year update to the Plan. Efforts will be made immediately by the Local Mitigation Officer to address any failed plan goals.

<b>ELEMENT A: PLANNING PROCESS   A6</b>
Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6b.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>evaluated</b> (assessing the effectiveness of the plan at achieving stated purpose and goals) over time? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Formal Update Process</b> below.
<b>Q&amp;A   ELEMENT A: PLANNING PROCESS   A6c.</b>
<b>Q:</b> Does the plan identify how, when, and by whom the plan will be <b>updated</b> during the 5-year cycle? (Requirement §201.6(c)(4)(i))
<b>A:</b> See <b>Formal Update Process</b> below.

### Formal Update Process

As identified above, the Mitigation Action Items will be monitored for status on an annual basis as well as an evaluation of the Plan's goals. The Local Mitigation Officer or designee will be responsible for contacting the Planning Team members and organizing the annual meeting which will take place annually during the month of the Plan's approval. 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 begin the update process with a review the goals and mitigation action items to determine their relevance to changing situations within 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** 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 is dedicated to involving the public directly in the continual review and updates to the Mitigation Plan. Copies of the plan will be made available at City Hall and and the City's website. The existence and location of these copies will be publicized in City Newsletters and on the website. This site will also contain an email address and phone number where people can direct their comments and concerns. At the discretion of the Local Mitigation Officer, a public meeting may be held after the Annual Implementation Meeting. The meeting would provide the public a forum in which interested individuals and/or agencies could express their concerns, opinions, or ideas about the plan.

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

# Attachments

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## FEMA Letter of Approval



## City Council Resolution

**ELEMENT A: PLANNING PROCESS | A1**

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))

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

**Q** Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan's development as well as who was involved.)

**A:** See **Web Postings of Second Draft Plan** below.

**ELEMENT A: PLANNING PROCESS | A2**

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 interests to be involved in the planning process? (Requirement §201.6(b)(2))

**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 **Web Postings of Second Draft Plan** below.

**ELEMENT A: PLANNING PROCESS | A3**

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

**Q&A | ELEMENT A: PLANNING PROCESS | A3a**

**Q:** Does the plan document how the public was given the opportunity to be involved in the planning process? (Requirement §201.6(b)(1))

**A:** See **Web Postings of Second Draft Plan** below.

## Web Posting of Second Draft Plan

### Facebook

 **City of Clayton, California**  
Published by Citie Manger · 2m · 

The City of Clayton is in the process of updating a Local Hazard Mitigation Plan (LHMP) to ensure that the City is as prepared as possible for potential future hazards. The draft LHMP is available on the City's website: <https://ci.clayton.ca.us/2021/05/10/20018/>.

If you have comments regarding the plan, please send them to the City at [rschwartz@ci.clayton.ca.us](mailto:rschwartz@ci.clayton.ca.us) by May 24th.

We look forward to hearing from you.



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 Comment as City of Clayton, California         

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**City of Clayton**

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**City of Clayton**  
 City Manager Reina Schwartz • Just now



Opportunity for Comments on Clayton's Draft Local Hazard Mitigation Plan. The City of Clayton is in the process of updating a Local Hazard Mitigation Plan (LHMP) to ensure that the City is as prepared as possible for potential future hazards. The draft LHMP is available on the City's website:  
 See more...



**DRAFT Hazard Mitigation Plan**  
[ci.clayton.ca.us](http://ci.clayton.ca.us)



**City of Clayton**  
 6,092 members [Invite](#)

77% of 4,461 households

21 neighborhoods

[Details](#) [Edit](#)

**ELEMENT A: PLANNING PROCESS | A1**

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))

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

**Q** Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan’s development as well as who was involved.)

**A:** See **Planning Team Sign-In Sheets** below.

## Planning Team Sign-In Sheet: Meeting 1 – January 4, 2021

City of Clayton  
 Hazard Mitigation Plan  
 Planning Team Meeting #1  
 January 4, 2021

(Note: Virtual meeting so initials entered electronically)

Name	Department
Reina Schwartz	RS
Scott Alman	SA
Matthew Feske	MF
Carolyn Harshman	CH

## Planning Team Sign-In Sheet: Meeting 2 – January 11, 2021

City of Clayton  
 Hazard Mitigation Plan  
 Planning Team Meeting #2  
 January 11, 2021

(Note: Virtual meeting so initials entered electronically)

Name	Department
Reina Schwartz	RS
Scott Alman	SA
Matthew Feske	MF
Carolyn Harshman	CH

## Planning Team Sign-In Sheet: Meeting 3 – January 19, 2021

City of Clayton  
 Hazard Mitigation Plan  
 Planning Team Meeting #3  
 January 19, 2021

(Note: Virtual meeting so initials entered electronically)

Name	Department
Reina Schwartz	RS
Scott Alman	SA
Matthew Feske	MF
Carolyn Harshman	CH

## Planning Team Sign-In Sheet: Meeting 4 – January 25, 2021

City of Clayton  
 Hazard Mitigation Plan  
 Planning Team Meeting #4  
 January 25, 2021

(Note: Virtual meeting so initials entered electronically)

Name	Department
Reina Schwartz	RS
Scott Alman	SA
Matthew Feske	MF
Carolyn Harshman	CH

## Planning Team Sign-In Sheet: Meeting 5 – February 12, 2021

City of Clayton  
 Hazard Mitigation Plan  
 Planning Team Meeting #5  
 February 12, 2021

(Note: Virtual meeting so initials entered electronically)

Name	Department
Reina Schwartz	RS
Scott Alman	SA
Matthew Feske	MF
Carolyn Harshman	CH

**ELEMENT A: PLANNING PROCESS | A1**

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))

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

**Q** Does the plan provide documentation of how the plan was prepared? (Note: This documentation must include the schedule or timeframe and activities that made up the plan's development as well as who was involved.)

**A:** See **Planning Team Minutes** below.

## Planning Team Minutes: Meeting 1 – January 4, 2021

### Minutes

#### City of Clayton

#### Planning Team Meeting #1 (Virtual)

January 4, 2021

**Attendance:**

Carolyn Harshman, Emergency Planning Consultants

Reina Schwartz, City of Clayton City Manager

Scott Alman, City of Clayton Former Contract City Engineer

Matthew Feske, City of Clayton Former Community Development Director

1. Examined the purpose of hazard mitigation.
2. Discussed the concepts and terms related to hazard mitigation planning.
3. Reviewed the project schedule and public involvement.

## Planning Team Minutes: Meeting 2 – January 11, 2021

### Minutes

City of Clayton

Planning Team Meeting #2 (Virtual)

January 11, 2021

#### Attendance:

Carolyn Harshman, Emergency Planning Consultants

Reina Schwartz, City of Clayton City Manager

Scott Alman, City of Clayton Former Contract City Engineer

Matthew Feske, City of Clayton Former Community Development Director

1. Gathered updated community profile data
  - a. History, geography, land use, demographics
2. Updated risk assessment
  - a. Team used Calculated Priority Risk Index to rank hazards
  - b. Vulnerability: Location, Extent, and Probability
    - i. Gathered historical information about previous significant occurrences
  - c. Hazards Maps
    - i. Reviewed HAZUS maps
  - d. Assess Vulnerability of Facilities to Hazards
    - i. EPC will assess vulnerability of critical and essential facilities (owned by the City) using the General Plan maps and other internet resources.

## Planning Team Minutes: Meeting 3 – January 19, 2021

### Minutes

#### City of Clayton

#### Planning Team Meeting #3 (Virtual)

January 19, 2021

#### Attendance:

Carolyn Harshman, Emergency Planning Consultants

Reina Schwartz, City of Clayton City Manager

Scott Alman, City of Clayton Former Contract City Engineer

Matthew Feske, City of Clayton Former Community Development Director

- I. Updated status of the items in the Mitigation Action Matrix identified in the Hazard Mitigation Plan
  - a. Continued to gather information from the Team members concerning the:
    1. Status of Mitigation Action Item: Completed, Deleted, Revised, Ongoing, New, Deferred
    2. Ratings: Priority, Benefit, Cost
    3. Funding Source and Planning Mechanism
    4. Impact to Buildings/Infrastructure
    5. Coordinating Agency
    6. Timeline
    7. Plan Goals accomplished
- II. Committee prepared new mitigation action items including ongoing action items (since old HMP) and future action items. Shared Action Item samples from County of Los Angeles All-Hazards Mitigation Plan.
  - a. Used Mitigation Action Item form to track:
    1. Action Items, Ideas for Implementation, Coordinating Organization, Timeline, Funding Source, Goals Accomplished, Rankings

## Planning Team Minutes: Meeting 4 – January 25, 2021

### Minutes

City of Clayton

Planning Team Meeting #4 (Virtual)

January 25, 2021

#### Attendance:

Carolyn Harshman, Emergency Planning Consultants

Reina Schwartz, City of Clayton City Manager

Scott Alman, City of Clayton Former Contract City Engineer

Matthew Feske, City of Clayton Former Community Development Director

- I. First Draft Plan was distributed in advance to the members of the Planning Team.
  - a. Plan overview provided.
  - b. Gaps identified and questions answered.
  - c. Discussed strategy for plan review, adoption, approval
    - ii. Order of gathering input to the Draft Plan
      1. Planning Team members
      2. General Public and External Agencies
        - a. Public (notice of plan availability)
        - b. External Agencies: Servicing Special Districts and Adjoining Jurisdictions