

COUNTY OF MONTEREY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN



VOLUME 2

March 2022

Carmel-by-the-Sea

Gonzales

King City

Monterey

Salinas

Seaside

Carmel Area Wastewater District

Monterey County Water Resources Agency

Monterey One Water

Monterey Regional Waste Management District

Moss Landing Harbor District

Del Rey Oaks

Greenfield

Marina

Pacific Grove

Sand City

Soledad



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JURISDICTIONAL ANNEXES

This Volume, **Volume 2** of the Monterey County Multi-Jurisdictional Hazard Mitigation Plan contains the following Jurisdictional Annexes for each participating jurisdiction.

- A** Unincorporated County of Monterey (and Monterey County Water Resources Agency)
- B** City of Carmel-by-the-Sea
- C** City of Del Rey Oaks
- D** City of Gonzales
- E** City of Greenfield
- F** City of King
- G** City of Marina
- H** City of Monterey
- I** City of Pacific Grove
- J** City of Salinas
- K** City of Sand City
- L** City of Seaside
- M** City of Soledad
- N** Carmel Area Wastewater District
- O** Monterey One Water
- P** Monterey Regional Waste Management District
- Q** Moss Landing Harbor District

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INTRODUCTION

BACKGROUND

The hazards assessed in Volume 1 of this Plan know no legal and political boundaries and therefore, the County of Monterey determined that a multi-jurisdictional planning approach to hazard mitigation was important for long-term risk reduction. The multi-jurisdictional planning processes offered many benefits including:

- Improving communication and coordination among Monterey County jurisdictions and Operational Area partners on hazard mitigation
- Enabling a comprehensive mitigation approach to reduce risks that affect multiple jurisdictions
- Maximizing economies of scale by leveraging individual capabilities and sharing costs and resources

The Federal Emergency Management Agency (FEMA) encourages multi-jurisdictional planning for hazard mitigation. All participating jurisdictions must meet the requirements of Chapter 44 of the Code of Federal Regulations (44 CFR §201.6). For the Monterey County Hazard Mitigation Plan, a Planning Partnership was formed to leverage resources and to meet requirements of the federal Disaster Mitigation Act (DMA) for as many eligible local governments as possible. There are two types of Planning Partners that participated in this process, with distinct needs and capabilities:

- Incorporated Cities and the unincorporated County
- Special Purpose Districts

Each participating planning partner has prepared a jurisdiction-specific annex to this plan. These annexes, as well as information on the process by which they were created, are contained in this Volume.

PURPOSE

Annexes included in **Volume 2** of the Monterey County Multi-Jurisdictional Hazard Mitigation Plan detail the hazard mitigation planning elements specific to the participating jurisdictions.

The Annexes are not intended to be standalone documents but append to and supplement the information contained in **Volume 1**. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the participating jurisdictions. The Annexes provide additional information specific to participating jurisdictions, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for individual jurisdictions.

THE PLANNING PARTNERSHIP

For this update of the Monterey County Multi-Jurisdictional Hazard Mitigation Plan, the Monterey County OES Planning Team formed a Steering Committee, which contained a representative from each participating jurisdiction. Each jurisdiction's Steering Committee representative was also the lead for their respective Jurisdictional Hazard Mitigation Plan Stakeholder Team.

INITIAL SOLICITATION

The Monterey County OES Planning Team solicited the participation of all eligible municipalities and special purpose districts at the outset of this project. A kickoff meeting was held on May 22, 2019, to identify potential stakeholders and planning partners for this process. The purpose of the meeting was to introduce the planning process to jurisdictions in the County that could have a stake in the outcome of the planning effort. All eligible local governments, including prior and potential planning partners, within the County were invited to attend. The goals of the meeting were as follows:

- Provide an overview of the Disaster Mitigation Act.
- Review the 2016 MJHMP and Planning Partnership
- Outline the work plan for this hazard mitigation plan.
- Describe the benefits of multi-jurisdictional planning.
- Solicit planning partners.
- Outline planning partner expectations.
- Solicit volunteers/recommendations for the Steering Committee.

PLANNING PARTNERSHIP EXPECTATIONS

The Monterey County OES Planning Team developed the following list of planning partner expectations:

- Assign a Jurisdictional representative to the Steering Committee, who will concurrently serve as the lead for their respective Jurisdictional Hazard Mitigation Plan Stakeholder Team.
- Participate in Steering Committee Meetings.
- Hold At least one Jurisdiction Specific Hazard Mitigation Planning Meeting.
- Conduct at least one Public Presentation on the MJHMP Update and support the public involvement strategy.
- Perform a capability assessment, which includes completing the Capability Assessment, National Flood Insurance (NFIP), and Safe Growth Surveys.
- Complete and review all elements of the Jurisdictional Annex template.
- Participate in the creation of the Countywide mitigation strategy, including the development of Countywide hazard problem statements and mitigation actions.
- Develop Jurisdiction-specific hazard problem statements and mitigation actions.
- Review and approve **Volume 1** of the MJHMP.
- Adopt the plan, including both **Volume 1**, and the respective Jurisdiction Annex.

By adopting this plan, each planning partner also agrees to the plan implementation and maintenance protocol established in **Volume 1**. Failure to meet these criteria may result in a partner being dropped from the partnership by the Steering Committee, and thus losing eligibility under the scope of this plan.

ANNEX-PREPARATION PROCESS

JURISDICTION HAZARD MITIGATION PLAN STAKEHOLDER TEAM

Each jurisdiction's respective Steering Committee representative established their own Jurisdiction Hazard Mitigation Plan Stakeholder Team. Jurisdiction-specific Stakeholder Teams included, as applicable, representatives from the following departments: City Management, Economic Development, Emergency Management, Fire Department/District, Floodplain Administration (NFIP Coordinator), GIS and/or IT, Parks & Recreation, Planning/Community Development, Police Department, and Public Works. Additionally, Jurisdiction Leads included anyone else they deemed relevant for local hazard mitigation and disaster risk reduction efforts.

Details on the members of each Jurisdiction Hazard Mitigation Plan Stakeholder Team is included in each jurisdictions respective Annex.

CAPABILITY ASSESSMENT

Per 44 CFR Section 201.6(c)(3), the plan must include a mitigation strategy based on existing authorities, policies, programs, and resources, therefore all participating jurisdictions undertook a review of their current capabilities to implement hazard mitigation actions. A capability assessment creates an inventory of a jurisdiction's mission, programs, and policies, and evaluates its capacity to carry them out. This assessment identifies potential gaps in the jurisdiction's capabilities. If the capability assessment identified an opportunity to add a missing core capability or expand an existing one, then doing so has been selected as an action in the jurisdiction's action plan.

Specific capabilities evaluated under the assessment fell into in the following four different types of capabilities as defined by FEMA.¹

- *Planning and Regulatory Capabilities*: capabilities based on the jurisdiction's implementation of ordinances, policies, local laws, and State statutes, and plans and programs that relate to guiding and managing growth and development.
- *Administrative and Technical Capabilities*: capabilities associated with the jurisdiction's staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.
- *Fiscal Capabilities*: refers to the fiscal resources that a jurisdiction has access to or is eligible to use to fund mitigation actions.
- *Education and Outreach Capabilities*: refers to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

¹ [Local Mitigation Planning Handbook](#), Worksheet 4.1: Capability Assessment Worksheet, FEMA (March 2013)

The capability assessment also included an assessment of safe growth, defined as the extent to which each jurisdiction is positioned to safely grow relative to its natural hazards. This was used to provide some quantitative measures of how adequately existing planning mechanisms and tools are being used to address the notion of safe growth. Per 44 CFR Section 201.6(c)(3)(ii), the capability assessment addressed each jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Additionally, classifications under various community mitigation programs were included. Other programs, such as the Community Rating System, Storm/Tsunami Ready, and Firewise USA, can enhance a jurisdiction's ability to mitigate, prepare for, and respond to natural hazards. These programs indicate a jurisdiction's desire to go beyond minimum requirements set forth by local, state, and federal regulations in order to create a more resilient community. These programs complement each other by focusing on communication, mitigation, and community preparedness to save lives and minimize the impact of natural hazards on a community.

For participating special districts, a slightly different capability assessment was used in order to capture capabilities more specific to their individual services. Special district capability assessments are included in the respective annexes.

JURISDICTION SPECIFIC HAZARD MITIGATION PLANNING MEETINGS

Each participating jurisdiction held at least one Jurisdiction Specific Hazard Mitigation Planning Meeting. At these meetings, the respective Hazard Mitigation Plan Stakeholder Team discussed hazard vulnerabilities, mitigation activities that had occurred since the last Plan update, hazard problem statements, and the mitigation action plan.

Each jurisdiction also went through a risk ranking process using the Threat Hazard Risk Assessment (THIRA) Survey. In the risk-ranking exercise, each planning partner was asked to review and rank the hazards identified in **Volume 1**, specifically for their jurisdiction. This ranking was based on the geographic extent, the likelihood of future occurrences, the expected magnitude/ severity of the hazard, and the potential impact on people, property, and the economy. The methodology was the same as the one used for the Countywide risk ranking that was presented in **Volume 1**. The objectives of this exercise were to familiarize the Hazard Mitigation Plan Stakeholder Team with how to use the risk assessment as a tool to support other planning and hazard mitigation processes and to help prioritize types of mitigation actions that should be considered. Hazards that were ranked as "high" for each jurisdiction as a result of this exercise were considered to be priorities for identifying appropriate mitigation actions.

HAZARD PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the Hazard Mitigation Plan Stakeholder Teams identified key vulnerabilities and hazards of concern applicable to their jurisdiction. Hazard Problem Statements helped the Hazard Mitigation Plan Stakeholder Teams identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation.

IDENTIFICATION OF MITIGATION ACTIONS

Each jurisdiction who participated in the 2016 planning process reviewed and updated their actions from the 2016 Plan. In order to improve the mitigation action plan for this Plan update and align with the Countywide Mitigation Action Plan, jurisdictions added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

In formulating the mitigation strategy, a wide range of actions were considered in order to help achieve mitigation goals and address specific hazard concerns. These activities were discussed during the Planning Team meetings. In general, all activities considered can be classified under one of the following five broad categories of mitigation techniques: local plans and regulations, structure and infrastructure projects, natural systems protection, education and outreach, and emergency preparedness and response. All of these categories are described in detail below.

Local Plans and Regulations

Mitigation actions that fall under this category include government authorities, policies, or codes that influence the way land and buildings are developed and built. Examples of these types of actions include:

- Comprehensive and General Plans
- Climate Action and Adaptation Plans
- Land Use Ordinances and Subdivision Regulations
- Zoning and Building Code Updates
- Capital Improvement Plans, Stormwater Management Regulations, and Master Plans

Structure and Infrastructure Projects

Mitigation actions that fall under this category involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards. Examples of these types of actions include:

- Elevation of Flood-Prone Structures
- Utility Undergrounding
- Structural Retrofits
- Stormwater System Upgrades

Natural Systems Protection

Mitigation actions that fall under this category minimize damage and losses and also preserve or restore the functions of natural systems. Examples of these types of actions include:

- Stream Corridor and Wetland Restoration
- Sediment and Erosion Control
- Forest and Vegetation Management
- Conservation Easements and Open Space Preservation

Education and Outreach

Mitigation actions that fall under this category inform and educate the public, elected officials, and property owners about hazards and potential ways to mitigate them. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions. Examples of these types of actions include:

- Risk Communication and Education Programs
- Real Estate Disclosures
- Participation in StormReady or Firewise Program

Emergency Preparedness and Response

Though emergency preparedness and response activities do not always fall under hazard mitigation, stakeholders in Monterey County believe this is an incredibly important category of strategies for reducing the risk to life and property posed by the hazards in the MJHMP. Examples of these types of actions include:

- Warning Systems
- Emergency Operations Center Improvements
- Emergency Operations Plan Updates
- Community Emergency Response Team (CERT) Programs
- Emergency Response Training and Exercises
- Evacuation Planning

MITIGATION ACTION PRIORITIZATION AND BENEFIT/COST REVIEW

44 CFR requires actions identified in the action plan to be prioritized (44 CFR, Section 201.6(c)(3)(iii)). The Planning Team and the Steering Committee decided to use FEMA's recommended prioritization criteria, STAPLEE, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- *Social*: Does the measure treat people fairly? (e.g., different groups, different generations) Does it consider social equity, disadvantaged communities, or vulnerable populations?
- *Technical*: Will it work? (Is the action technically feasible? Does it solve the problem?)
- *Administrative*: Is there capacity to implement and manage the project? Is there adequate staffing, funding, and other capabilities to implement the project?
- *Political*: Who are the stakeholders? Did they get to participate? Will there be adequate political and public support for the project?
- *Legal*: Does the jurisdiction have the legal authority to implement the action? Is it legal? Are there liability implications?
- *Economic*: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- *Environmental*: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

44 CFR requires the prioritization of the action plan to emphasize a benefit/cost analysis of the proposed actions. Because some actions may not be implemented for up to 10 years, the benefit/cost analysis was qualitative and not of the detail required by FEMA for project grant eligibility under the Hazard Mitigation Assistance (HMA) grant program. 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 benefits and costs as follows:

Cost ratings were defined as follows:

- High: Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source.
- Medium: The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- Low: The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- High: Project will provide an immediate reduction of risk exposure for life and property.
- Medium: Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- Low: Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly. For many of the strategies identified in this action plan, funding might be sought under FEMA's HMA program. This program requires detailed benefit/cost analysis as part of the application process. These analyses will be performed on projects at the time of application preparation. The FEMA benefit-cost model will be used to perform this review. For projects not seeking financial assistance from grant programs that require this sort of analysis, the Partners reserve the right to define "benefits" according to parameters that meet their needs and the goals and objectives of this Plan.

HAZARD MITIGATION ACTION PLAN MATRICES

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the planning process. The Hazard Mitigation Action Plan Matrix for each jurisdiction lists each priority mitigation action, identifies a time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

It should be noted that in addition to the mitigation actions within this Volume, jurisdictions have also prioritized the countywide actions included in **Volume 1** of this plan. Collectively, this multi-jurisdictional mitigation strategy focuses on those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5- years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five-year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to

preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement. All actions included in this Plan update were determined to have a positive benefit cost ratio.

Hazard Mitigation Actions Plan Matrices for each jurisdiction are available on the following pages:

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JURISDICTION ANNEX TEMPLATES

Following respective jurisdiction Specific Hazard Mitigation Planning Meetings, the Monterey County OES Planning Team compiled information from the capability assessment surveys, the risk ranking process, and discussions on hazard vulnerabilities, problem statements, and mitigation actions into Jurisdiction-Specific Annex Templates.

The templates were created to help the Planning Partners prepare and review their jurisdiction-specific Annexes. Since special purpose districts operate differently from incorporated municipalities, separate templates were created for the two types of jurisdictions. The templates were created so that all criteria of Section 201.6 of 44 CFR would be met, based on the partners' capabilities and mode of operation.

Jurisdictions then edited, reviewed, and updated their respective Jurisdiction Annex template and provided final edits and approval to the Monterey County OES Planning Team.

FINAL COVERAGE UNDER THIS PLAN

All jurisdictions that intended to participate in the planning process fully met the participation requirements for this update, completed an annex template, and will be covered by the updated hazard mitigation plan upon FEMA approval and adoption by their governing bodies. This final coverage will apply to the following jurisdictions:

- Unincorporated Monterey County
- Monterey County Water Resources Agency (MCWRA) (Included with unincorporated Monterey County)
- City of Carmel-by-the-Sea
- City of Del Rey Oaks
- City of Gonzales
- City of Greenfield
- City of King
- City of Marina
- City of Monterey
- City of Pacific Grove
- City of Salinas
- City of Sand City
- City of Seaside
- City of Soledad
- Carmel Area Wastewater District (CAWD)
- Monterey Regional Waste Management District (MRWMD)
- Monterey One Water (M1W)
- Moss Landing Harbor District

All participating jurisdictions will adopt **Volume 1** in its entirety and their own jurisdiction-specific annex in **Volume 2**. It should also be noted that the Monterey County Water Resources Agency as a dependent special district is covered under the Unincorporated Monterey County Annex. The Agency participated extensively in both the Steering Committee and the unincorporated County Hazard Mitigation Planning Team. The Plan will also be adopted by the Monterey County Water Resources Agency Board, in addition to its adoption by the Monterey County Board of Supervisors.

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ANNEX A: MONTEREY COUNTY



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



A. UNINCORPORATED MONTEREY COUNTY

A.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

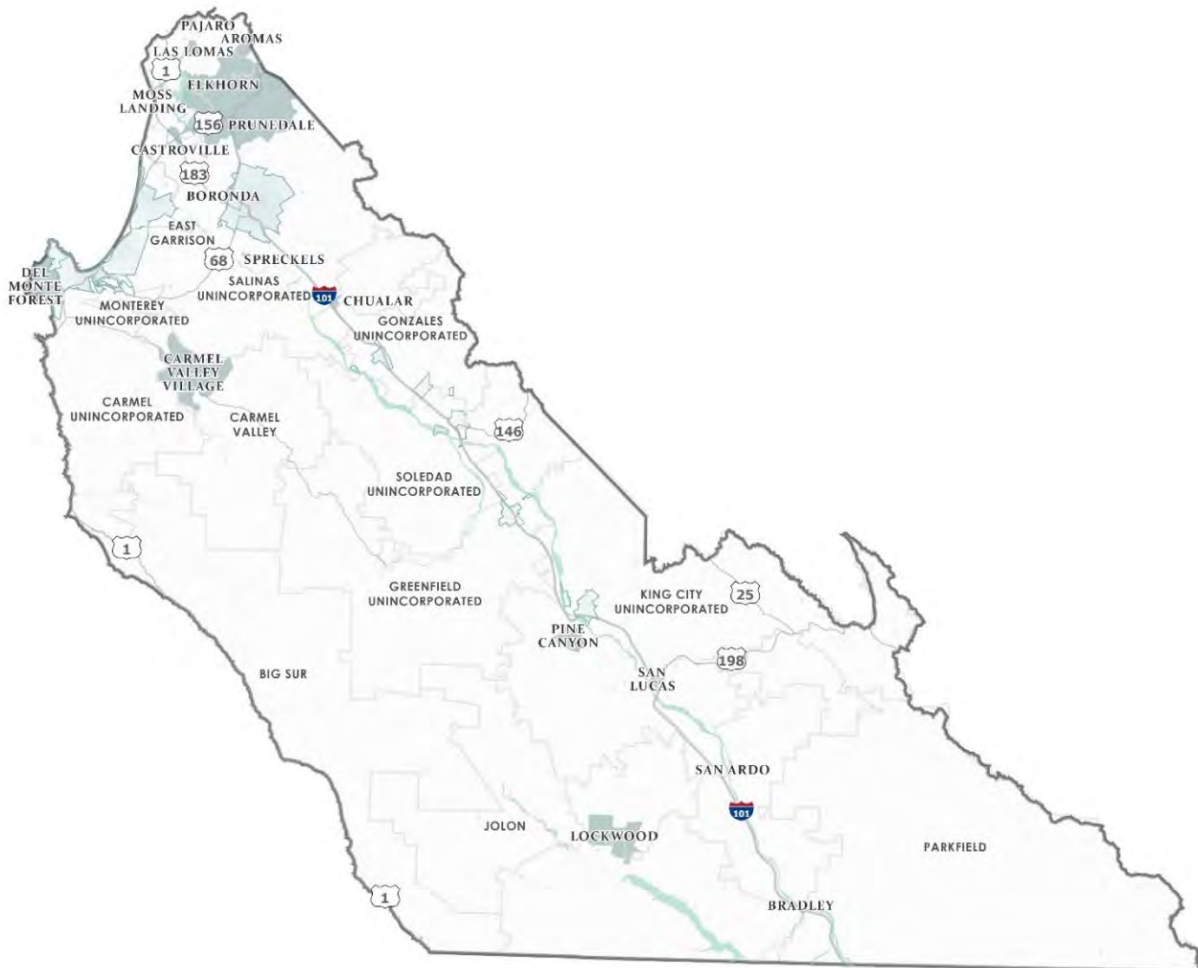
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A.2 COMMUNITY PROFILE

A.2.1 LOCATION



A.2.2 GEOGRAPHY AND CLIMATE

Monterey County is located on the north-central coast of California. Monterey County is bordered by Santa Cruz County to the North, San Benito, Fresno, and King Counties to the East, San Luis Obispo County to the South, and the Pacific Ocean to the West. Prominent land features in the county include two major northwest-southeast trending mountain ranges—the Santa Lucia Range along the coast, and the Gabilan Range along the county’s eastern border, both of which are part of the Pacific Coast Range. Between the Santa Lucia and Gabilan mountain ranges lies the Salinas Valley; and at the center of the Valley flows the Salinas River, the largest river on California’s Central Coast.

Unincorporated Monterey County has many communities. Because of Monterey County’s large geographic area, the unincorporated communities are Census Designated Places:

- **North County:** Pajaro, Moss Landing, Las Lomas, Aromas, Elkhorn, Castroville and Prunedale
- **Salinas Valley:** Boronda, Spreckels, Toro Park, East Garrison, San Benancio, and Corral de Tierra
- **Coastal Area:** Carmel Valley Village, Del Monte Forest, Cachagua, and Big Sur
- **South County:** Chualar, Pine Canyon, Lockwood, Bradley, San Lucas, and San Ardo

The climate in Monterey County is considered Mediterranean, with dry summers, rainy winters, and moderate temperatures year-round. Precipitation in the region falls mainly between November and April. Large variations exist in rainfall amounts between coastal and inland areas, as well as from year to year and from sea level to altitude along the coast.

A.2.3 HISTORY

Before the European colonization, the Monterey area had been inhabited for over 8,000 years. Indigenous peoples lived in the valleys and near the seaside and the area was inhabited by three major native groups: the Costanoan (Ohlone), Esselen, and Salinan groups. The Salinan Indigenous Americans lived in southern region of the County and had about 3,500-4,000 members. The Esselen Indigenous Americans had several hundred members and resided on the northwest coast of the County. The Costanoan (Ohlone) group was the largest in the area with around 7,000 people, occupying Monterey Peninsula and northern region of the County.

Spanish explorers first settled in Monterey Bay in the early 1600s and Franciscan missionaries began constructing missions in the late 1700s. The Presidio of Monterey was first founded on June 3, 1770, by Spanish soldiers. Spain established a formal pueblo government in 1791. By 1814, several non-Spanish immigrants had begun to settle in Monterey and in 1826, after Mexico’s secession from Spain, Alta California was controlled by Mexico. Following the Mexican American War, the Treaty of Guadalupe Hidalgo, signed in February 1848, formally ceded Alta California, which included Monterey County, to the United States.

Monterey County was one of the original counties of California, created in 1850 at the time of statehood. The discovery of gold in the Sierra Nevada foothills in 1849 brought droves of homesteaders to the county, and as the best parcels in Monterey and the Salinas Valley became occupied, homesteading spread to the rugged Big Sur coast. By 1870, commercial agriculture was well underway in the Salinas Valley. A major drought in 1863 and 1864 essentially wiped out the cattle industry, and grain production became the County’s principal agricultural activity. Sugar beet cultivation and dairying began to replace grain farming by 1897. The extension of the Southern Pacific

Railroad from Pajaro to Salinas, along with improved irrigation systems, refrigerated freight cars, and other innovations in technology, encouraged more and more intensive row crop cultivation and set the stage for the Salinas Valley to become one of the most productive agricultural regions in the world.

A.2.4 POPULATION

Unincorporated Monterey County has a population of 104,482 people, a decrease of 4% since 2010. Population of unincorporated communities in Monterey County, including percentage change since 2010, is summarized in *Table A-1*.

Community	2020 Population	2010 Population	Percent Change
Aromas	2,708	1,358	99%
Boronda	1,760	1,710	3%
Bradley	69	93	-26%
Carmel Valley Village	4,524	4,407	3%
Castroville	7,515	6,481	16%
Chualar	1,185	1,190	0%
Del Monte Forest	4,204	4,514	-7%
Elkhorn	1,588	1,565	1%
Las Lomas	3,046	3,024	1%
Lockwood	368	379	-3%
Moss Landing	237	204	16%
Pajaro	2,882	3,070	-6%
Pine Canyon	1,871	1,822	3%
Prunedale	18,885	17,560	8%
San Ardo	392	517	-24%
San Lucas	324	269	20%
Spreckels	692	673	3%
Remaining Unincorporated Areas	52,250	51,377	2%
Total Unincorporated Population	104,482	100,213	4%

A.2.5 GOVERNING BODY FORMAT

Unincorporated Monterey County is governed by the Monterey County Board of Supervisors. Like all governing bodies in California, the Monterey County Board of Supervisors is empowered with both legislative and executive authority over the entirety of Monterey County and is the primary governing body for all unincorporated areas within the County boundaries.

The Board of Supervisors appoints members of the public to serve on a variety of advisory committees and commissions. The County Administrative Officer (CAO) is responsible for managing the day-to-day operations of the County.

The Board has five elected members, each of whom represents one of five supervisorial districts summarized below:

- **District 1** is geographically the smallest supervisorial district in Monterey County and is entirely within the city limits of the city of Salinas.
- **District 2** is the northernmost supervisorial district in Monterey County, the 2nd District includes the communities of Boronda, Castroville, Las Lomas, Moss Landing, Pajaro, Prunedale, Royal Oaks, the northern neighborhoods of the city of Salinas, and those portions of the community of Aromas that are located within Monterey County.
- **District 3** covers the majority of the Salinas Valley and southern Monterey County, extending to its border with San Luis Obispo County. The district includes the unincorporated communities of Spreckels, Chualar, Jolon, the eastern portion of the city of Salinas, and the cities of Gonzales, Greenfield, Soledad, and King City. Additionally, it includes the military installations at Fort Hunter Liggett and Camp Roberts, as well as portions of the Los Padres National Forest.
- **District 4** includes the southwest portion of the city of Salinas, the cities of Del Rey Oaks, Marina, Seaside, Sand City, and the former military installation at Fort Ord.
- **District 5** is geographically the largest of the five supervisorial districts and covers most of the Monterey Peninsula and southern coastline of Monterey County down to the southern county border with San Luis Obispo County. The 5th District includes the cities of Carmel-by-the-Sea, Monterey, and Pacific Grove, the unincorporated communities of Carmel Valley, Big Sur, Pebble Beach, San Benancio, Corral de Tierra, and Jamesburg. Additionally, it includes the military installations at the Presidio of Monterey, the Defense Language Institute, and the Naval Postgraduate School, as well as the Ventana Wilderness area of the Los Padres National Forest.

Monterey County Water Resources Agency (MCWRA)

The Monterey County Water Resources Agency (MCWRA), which is included and covered under this Annex is a dependent special district. Dependent special districts are governed by other, existing legislative bodies (either a city council or a county board of supervisors). Prior to being formally established in 1991, the Monterey County Water Resources Agency (MCWRA) was the Monterey County Flood Control and Water Conservation District, established in 1947 and organized as a division of the Public Works Department of the County of Monterey.

MCWRA provides services related to the control of flood and storm waters in Monterey County, conservation, protection of water quality, reclamation of water and the exchange of water. Fundamental to the agency's mission to sustainably manage water resources while minimizing impacts from flooding, MCWRA owns and operates two dams on principal tributaries to the Salinas River (Nacimiento and San Antonio) along with associated reservoirs.

The Board of Supervisors of Monterey County is ex officio the Board of Supervisors of the Agency. The Agency is governed by a nine-member Board of Directors who are appointed by the Monterey County Water Resources Agency Board of Supervisors and the Board of Directors is under the governance of the Monterey County Water Resources Agency Board of Supervisors. Directors must be residents of Monterey County and possess backgrounds and experience indicating a high level of interest or expertise in areas relating to the Agency's work. Each of the five members of the Board of Supervisors selects one member for the Board of Directors, with the remaining four directors being appointed by a majority vote of the Supervisors from nominees submitted by the following groups or organizations: Monterey County Farm Bureau; Grower-Shipper Association; City Select Committee; and the Monterey

County Agricultural Advisory Committee. The term of office for each director is four years. Directors may be reappointed at the end of their terms.

Duties of the Board of Directors, with the assistance of staff, include the following:

- Establishes short and long-term policy objectives for the Agency, subject to review by the Board of Supervisors
- Prepares an annual budget
- Holds public hearings on proposed budget
- Approves all contracts for which funds have been budgeted

A.2.6 ECONOMY AND TAX BASE

Monterey County's economy is primarily based upon tourism in the coastal regions and agriculture in the Salinas Valley. It is also home to an extensive array of education and research institutions which contribute greatly to the economy. The non-profit sector is also one of the largest business sectors in the County.

A.3 PLANNING PROCESS

Unincorporated Monterey County followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the County formulated their own internal planning team to support the broader planning process.

Monterey County held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on August 30, 2021. Key stakeholders present at the meeting included:

- Erik V. Lundquist, Housing and Community Development Director
- Bryan Flores, Interim Chief of Parks
- Randell Ishii, Director of Public Works, Facilities and Parks
- Eric Chatham, Director Information Technology Department
- John Dugan, Housing & Community Development Special Project Manager
- Jennifer Bodensteiner, Monterey County Water Resources Agency (MCWRA), Associate Hydrologist
- Melanie Beretti, Housing & Community Development Services Manager
- Ashley Paulsworth, Sustainability Manager
- Shandy Carroll, Housing & Community Development Management Analyst III
- Lindsay Lerable, Public Works Chief of Facilities
- Jamie Tuitele-Lewis, Fire Fuel Mitigation Program and Forest Health Coordinator, RCDMC
- Kelsey Scanlon, Emergency Services Planner
- Laura Emmons, Emergency Services Planner
- Tracy Molfino, Emergency Services Planner

It should be noted that the Monterey County Water Resources Agency as a dependent special district is covered under this Annex, the Unincorporated Monterey County Annex. The Agency participated

extensively in both the Steering Committee and the unincorporated County Hazard Mitigation Planning Team. The Plan will also be adopted by the Monterey County Water Resources Agency Board, in addition to its adoption by the Monterey County Board of Supervisors.

A.4 LAND USE AND DEVELOPMENT

Monterey County began land use planning in 1930 with the creation of a Planning Commission followed by the establishment of a Planning Department 20 years later. The Planning Department completed its first general plan in 1968 and by the mid-1970s had adopted the State of California's mandated Safety Element as part of the plan.

Monterey County adopted its most recent General Plan in 2010. The 2010 General Plan applies in the unincorporated non-coastal area of the County. The policies of the General Plan underlie land use development decisions, and the County's zoning ordinances, specific plans, development projects, and capital improvement programs must be consistent with the General Plan. Monterey County has historically been planned as a rural county. Approximately 1% of the unincorporated county has been developed with residential, commercial, and industrial uses. Most of this development has been concentrated in the northern one-third of the county. Public and quasi-public uses, such as educational, transportation, military, recreational, cultural, and religious facilities, account for about an additional 28% of the county's total land area. Agriculture accounts for the largest land use, representing almost 60% of the unincorporated county's total land area.

The County has a variety of Area Plans which include: Central Salinas Valley Area Plan, Agricultural & Winery Corridor Plan, Cachagua Area Plan, Carmel Valley Master Plan, Toro Area Plan, Fort Ord Master Plan, Greater Monterey Peninsula Area Plan, North County Inland Area Plan, South County Area Plan, and Greater Salinas Area Plan. The County also has community plans for the communities of Fort Ord, Chualar, Boronda, Castroville, Pajaro, Carmel Valley Village, and Spreckels. Within the coastal zone, the governing general plan is the County's certified Local Coastal Program, which is broken into four segments represented by four Land Use Plans (LUPs) for specific defined areas: North County, Del Monte Forest, Carmel Area, and Big Sur.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the County's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The Monterey County Safe Growth Survey was completed by Dina Northcut, Management Analyst with the Monterey County Housing and Community Development Department. The results are summarized in *Table A-2*.

Table A-2
Monterey County Safe Growth Survey Results

Topic Area	2021	2016
Land Use	3.50	3.50
Transportation	4.00	3.00
Environmental Management	5.00	4.33
Public Safety	4.33	4.00
Zoning Ordinance	4.25	3.50
Subdivision Regulations	3.67	4.67
Capital Improvement Program & Infrastructure Policies	4.00	2.33
Building Code	4.00	5.00
Economic Development	3.00	2.00
Average Survey Ratings	3.97	3.59

A.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the Unincorporated Monterey County's hazards and assess the vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to Unincorporated Monterey County is included in this Annex.

The Unincorporated Monterey County's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The County's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the unincorporated County. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**.

Table A-3 displays the results of the hazard risk ranking exercise that was performed by the Unincorporated Monterey County's Planning Team.

Table A-3
Threat Hazard Identification Risk Assessment (THIRA): Unincorporated Monterey County

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	2.6	2.4	2.2	2.7	9.9	Moderate
Coastal Erosion	2.5	2.9	2.8	2.7	10.9	Substantial
Coastal Flooding	2.6	2.9	2.8	2.7	11.0	Substantial
Cyber-Attack	2.3	2.2	2.5	2.4	9.4	Moderate
Dam Failure	2.8	1.5	2.9	3.0	10.1	Substantial
Drought & Water Shortage	3.1	2.9	3.2	3.2	12.4	High
Earthquake	2.9	2.4	2.9	2.9	11.1	Substantial
Epidemic	2.6	2.1	2.4	2.3	9.4	Moderate
Extreme Cold & Freeze	2.0	1.9	1.9	1.8	7.6	Possible
Extreme Heat	2.8	2.7	2.3	2.1	9.9	Moderate
Flash Flood	2.4	2.1	2.3	2.3	9.0	Moderate
Hazardous Materials Incident	1.8	1.9	1.7	1.8	7.1	Possible
Invasive Species	2.6	2.4	2.1	2.0	9.1	Moderate
Levee Failure	2.4	2.1	2.2	2.6	9.3	Moderate
Localized Stormwater Flooding	2.8	3.0	2.6	2.6	11.0	Substantial
Mass Migration	2.0	1.7	1.6	1.6	6.8	Possible
Pandemic	2.9	2.6	2.9	2.9	11.2	Substantial
Riverine Flooding	2.3	2.8	2.6	2.6	10.2	Substantial
Sea Level Rise	2.6	2.8	2.9	2.6	10.9	Substantial
Severe Winter Storms	2.8	2.8	2.6	2.5	10.6	Substantial
Slope Failure	2.6	2.7	2.9	2.7	10.8	Substantial
Targeted Violence	1.8	1.8	1.8	1.9	7.1	Possible
Terrorism	1.8	1.8	1.9	1.9	7.3	Possible
Tsunami	2.1	2.0	2.4	2.5	9.0	Moderate
Utility Interruption/ PSPS	2.4	2.7	2.2	2.1	9.4	Moderate
Water Contamination	2.6	2.1	2.6	2.8	10.1	Substantial
Wildfire	3.2	3.2	3.5	3.3	13.1	High
Windstorms	2.3	2.1	2.1	1.9	8.4	Moderate

A.5.1 AGRICULTURAL EMERGENCIES

The agricultural industry is a major economic driver in the County. Agricultural disasters pose a serious threat to the local economy and populations directly employed by the agriculture industry. Including production and local processing, and after subtracting significant subsidies, estimates put agriculture's net 2018 tax contribution at \$61.9 million to \$122.7 million. This included excise, sales, and property

taxes, as well as fees, licenses, and permits (but not income taxes).² Therefore, even small impacts from agricultural emergencies could have a large impact on County services.

A.5.2 COASTAL EROSION

To determine coastal erosion risk, USGS Pacific Coastal and Marine Science Center Coastal Storm Modeling (CoSMos) shoreline change, and cliff retreat projection data was used. For cliff retreat modeling an end of century (2100) forced sea level rise amount of 200 cm was used based on Ocean Protection Council (OPC) High Risk Aversion Guidance.

For shoreline change, winter erosion uncertainty modeling was used to capture the degree of uncertainty associated with future shoreline erosion. Hold the Line scenario modeling was chosen for both types of erosion. Three sea level rise levels (25 cm, 75 cm, and 200 cm) to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk. *Table A-4* summarizes population and property exposure to coastal erosion risk.

Table A-4

Population and Property Exposed to Coastal Erosion Risk in Unincorporated Monterey County

Sea Level Rise Scenario/ Erosion Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Cliff Erosion					
Sea Level Rise (25 cm)	909	199	\$1,107,044,203	180	\$212,903,839
Sea Level Rise (75 cm)	1,470	219	\$1,167,783,359	179	\$212,903,839
Sea Level Rise (200 cm)	1,646	233	\$1,231,807,382	186	\$154,510,855
Shoreline Erosion					
Sea Level Rise (25 cm)	455	4	\$3,099,857	28	\$73,864,312
Sea Level Rise (75 cm)	179	4	\$3,099,857	28	\$73,864,312
Sea Level Rise (200 cm)	179	4	\$3,099,857	29	\$74,374,903

A.5.3 DAM AND LEVEE FAILURE

Dam Failure

Table A-5 summarizes population and property in the County exposed to spillway and dam failure of the Nacimiento, San Antonio, Los Padres, and Forest Lake dams. It should be noted that both the San Antonio and Nacimiento dams are owned and managed by MCWRA.

² Monterey County Agricultural Commissioner, 2020, [Economic Contributions of Monterey County Agriculture](#)

Table A-5
Population and Property Exposed to Dam Failure Risk in Unincorporated Monterey County

Dam Failure Scenario	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Nacimiento Spillway Failure	8,451	170	\$81,972,951	2,389	\$1,710,686,191
Nacimiento Dam Failure	13,466	1,163	\$475,463,687	3,165	\$2,649,111,539
San Antonio Spillway Failure	3,581	62	\$22,456,021	1,941	\$1,085,304,869
San Antonio Dam Failure	12,361	977	\$450,695,254	3,178	\$2,303,214,030
Los Padres Dam	5,784	943	\$779,795,548	419	\$196,382,343
Forest Lake Dam Scenario 1 North Embankment Failure	302	38	\$47,663,347	12	\$97,873,581
Forest Lake Dam Scenario 2 South Embankment Failure	403	48	\$54,833,015	16	\$62,584,773
Forest Lake Dam Scenario 3 Outlet Structure Failure	23	0	\$0	0	\$0
Forest Lake Dam Scenario 4 NW South Embankment Failure	834	266	\$356,389,582	52	\$77,207,153

Levee Failure

Data on levee location, leveed area, and population and property exposed to levee failure risk was from the US Army Corp of Engineers, National Levee Database. Leveed Area, which is defined as the estimated area of a floodplain from which flood water is excluded by the levee system, was used to determine the population and property exposed to levee failure. Population and property exposed to levee failure in unincorporated Monterey County by waterbody is summarized in *Table A-6*.

Table A-6
Population and Property Exposed to Levee Failure in Unincorporated Monterey County

Waterbody	Miles of Levee	Leveed Area in Square Miles	Population	Structures	Property Value
Bennett Slough	0.9	0.35	6	1	\$544,000
Carmel River	2.1	0.17	633	111	\$258,000,000
Elkhorn Slough	5.6	0.62	0	0	\$0
Moro Cojo Slough	4.3	0.87	0	0	\$0
Pajaro River	9.2	5.97	3,597	811	\$481,000,000
Salinas River	29.6	8.51	23	8	\$55,501,000
Total	51.7	16.49	4,259	931	\$795,045,000

Source: US Army Corp of Engineers, [National Levee Database](#)

Many levees in the County also protect important agricultural lands and a significant levee failure could have a large economic effect on the agricultural industry and the economy. Additionally, it should be noted that left (southern) bank of the Pajaro River Levee System is maintained by the Monterey County Water Resources Agency (MCWRA). The MCWRA has an emergency plan that identifies critical stages of the river and the related actions that the Office of Emergency Services takes such as declaring

an emergency and mobilizing emergency responders. The MCWRA also has an ALERT system that monitors river levels whenever significant storms approach the area.

A.5.4 DROUGHT AND WATER SHORTAGE

The entire population of Unincorporated Monterey County is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, relatively affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and could impact the County economically.

A.5.5 EARTHQUAKE

The entire population of the unincorporated County is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the County is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 128,966 residential and non-residential buildings in the unincorporated County, with a total value of \$73,489,253,104. Since all structures in the County are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table A-7* summarizes population and property in the County exposed to liquefaction risk.

Table A-7
Population and Property Exposed Liquefaction Risk in Unincorporated Monterey County

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	67,840	6,777	\$4,468,219,528	8,240	\$4,277,956,816
Moderate Liquefaction Susceptibility	26,413	2,941	\$1,932,144,395	4,353	\$3,427,952,047

A.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table A-8* summarizes population and property in the County in the 100-year and 500-year floodplain.

Table A-8
Population and Property Exposed to Flooding Risk in Unincorporated Monterey County

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	48,259	3,474	\$3,179,753,966	6,015	\$4,194,752,812
500-Year Flood Zone	33,756	3,806	\$1,782,983,176	3,472	\$1,328,314,568

A.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table A-9 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table A-9
Population and Property Exposed to Hazardous Materials Risk in Unincorporated Monterey County

Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	54,877	12,901	\$10,393,026,686	9,171	\$4,695,598,628
Fixed Source	18,968	1,971	\$894,344,653	1,917	\$1,897,531,429

A.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

A.5.9 PUBLIC HEALTH HAZARDS

All citizens in the County could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health

hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the County, specifically vulnerable populations.

A.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the County. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the County likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract County-wide data was used to identify annualized frequency, exposure, and annual expected loss in the County from severe weather hazards. Though the entire County is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts.

FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table A-10*.

Table A-10			
Annualized Frequency and Exposure to Severe Weather Events in Unincorporated Monterey County			
Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.93	Frequency (<i>Distinct Events</i>)	0.24
Exposed Population	126,327	Exposed Population	126,327
Exposed Building Values	\$15,543,681,000	Exposed Building Values	\$15,543,681,000
Expected Annual Loss of Building Value	\$0.41	Expected Annual Loss of Building Value	\$7,156.12
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	2.02	Frequency (<i>Distinct Events</i>)	1.47
Exposed Population	125,672	Exposed Population	10,997
Exposed Building Values	\$15,431,313,849	Exposed Building Values	\$1,095,753,342
Expected Annual Loss of Building Value	\$38.91	Expected Annual Loss of Building Value	\$24,994,532
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.53	Frequency (<i>Event-Days</i>)	0.16
Exposed Population	126,327	Exposed Population	12,797
Exposed Building Values	\$15,543,681,000	Exposed Building Values	\$2,211,140,076
Expected Annual Loss of Building Value	\$2,476.82	Expected Annual Loss of Building Value	\$4,179.83
Source: FEMA National Risk Index			

A.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 57,314 people and \$8,028,885,261 in building value in the unincorporated Monterey County is exposed to landslide risk.

Additionally, exposure of population and property in the unincorporated Monterey County to earthquake induced landslides is summarized in *Table A-11*.

Table A-11

Population and Property Susceptible to Earthquake Induced to Landslides in Unincorporated County

Landslide Susceptibility	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High	33,185	2,525	\$2,451,693,405	4,080	\$13,97,470,150
Moderate	75,118	7,553	\$6,362,285,018	6,378	\$1,869,376,327

A.5.12 TSUNAMI

Population and property in the County located in a mapped tsunami inundation zone is summarized in *Table A-12*.

Table A-12

Population and Property in Tsunami Inundation Zone in Unincorporated Monterey County

Inundation Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Tsunami Inundation Zone	5,320	490	\$1,544,367,267	1,971	\$652,059,712

A.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the County is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the County that is operated by electricity is exposed and vulnerable to utility interruption.

A.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table A-13 summarizes population and property in the County in very high, high, and moderate fire threat areas.

Table A-13

Population and Property Exposed to Wildfire Risk in Unincorporated Monterey County

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	35,842	4,449	\$3,734,795,405	7,109	\$2,670,537,241
High Fire Threat	65,901	9,885	\$8,135,807,203	10,242	\$4,421,792,063
Moderate Fire Threat	82,713	14,086	\$14,585,627,278	10,060	\$5,653,773,683

A.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in unincorporated Monterey County and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure. Drought, coastal and inland flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the local economy, along with changes to agriculture and crops, which are a critical backbone of the County's economy. There will also be negative impacts to ecosystems, both on land and in the ocean, leading to local extinctions, migrations, and management challenges.

Sea level rise risk exposure in the unincorporated County was calculated based on the NOAA Office for Coastal Management [sea level rise viewer](#) projections. Three sea level rise levels (25 cm, 75 cm, and 200 cm) were chosen to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Population and property exposed to sea level rise risk is summarized in *Table A-14*.

Sea Level Rise Amount	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
1 ft Sea Level Rise (2030)	2,876	202	\$903,841,574	1,562	\$486,030,632
3 ft Sea Level Rise (2060)	3,677	235	\$1,054,134,804	1,682	\$579,033,642
7 ft Sea Level Rise (2100)	7,297	496	\$1,285,737,327	2,033	\$750,288,107

A.6 CAPABILITY ASSESSMENT

Unincorporated Monterey County performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table A-15*
- An assessment of administrative and technical capabilities is presented in *Table A-16*
- An assessment of fiscal capabilities is presented in *Table A-17*
- An assessment of education and outreach capabilities is presented in *Table A-18*
- Classifications under various community mitigation programs are presented in *Table A-19*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section A.6.1 in *Table A-20*
- An overall self-assessment of capability is presented in Section A.6.2 in *Table A-21*

Table A-15
Planning and Regulatory Capability

Document		Department	Comments
Planning Documents			
General Plan	☒	• HCD	
Capital Improvement Plan	☒	• Public Works	
Floodplain Management Plan	☒	• Public Works • HCD	
Open Space Management Plan	☒	• Public Works	
Stormwater Management Plan	☒	• Public Works	
Coastal or Shoreline Management Plan	☒	• HCD	
Local Coastal Program	☒	• HCD	Four LCP segments: North County, Del Monte Forest, Carmel Area, and Big Sur Coast.
Climate Action/ Adaptation Plan	☒	• Sustainability	In progress
Emergency Operations Plan	☒	• OES	
Continuity of Operations Plan	☒	• All Departments • OES	All Departments have developed Continuity of Operations Plans
Community Wildfire Protection Plan	☒	• Fire Safe Council	The plan was last updated in 2010
Evacuation Plan	☒	• OES	Update in progress.
Disaster Recovery Plan	☒	• OES	
Economic Development Plan	☒	• CAO • HCD	The plan was last updated in 2015.
Historic Preservation Plan	☐	•	Historical Preservation during disasters has been identified as a future annex to the EOP.
Transportation Plan	☒	• Public Works	
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	• Public Works	Chapter 16.16 - REGULATIONS FOR FLOODPLAINS IN MC
Zoning Ordinance	☒	• HCD	Title 21 - ZONING
Subdivision Ordinance	☒	• HCD	Title 19 - SUBDIVISIONS
Site Plan Review Requirements	☒	• HCD	
Post-Disaster Redevelopment/ Reconstruction Ordinance	☒	• HCD	Following significant disasters, the BOS will adopt resolutions to streamline the rebuilding process
Building Code	☒	• HCD	CHAPTER 18.02 - BUILDING CODE
Fire Prevention Code	☒	• HCD	CHAPTER 18.09 - FIRE CODE

Table A-16
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	- HCD - Public Works	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	- HCD - Public Works	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	- HCD - Public Works - OES	
Building Inspector	☒	Building	
Emergency Manager	☒	OES	Emergency Manager
Floodplain Manager	☒	- HCD - Public Works	
Land Surveyors	☐		
Resource development staff or grant writers	☒	Various	Monterey County departments apply for grants individually
Public Information Officer	☒	- Health Department - CAO	
Scientist(s) familiar with the hazards of the community	☒	Water Resources	
Staff with education or expertise to assess the community's vulnerability to hazards	☒	- HCD - Public Works - OES	
Personnel skilled in Geographic Information Systems (GIS)	☒	Information Technology	
Maintenance programs to reduce risk	☒	Public Works	
Warning systems/services	☒	OES	Nixle/ Everbridge
Mutual Aid Agreements	☒	OES	

Table A-17
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	Finance	
Capital Improvements Project Funding	☒	- Public Works - Finance	
Special Purpose Taxes	☒	Finance	
Stormwater Utility Fees	☐		

Table A-17
Fiscal Capability

Fiscal Resources	Department	Comments
Gas / Electric Utility Fees	☐	
Water / Sewer Fees	☐	•
Development Impact Fees	☒	• HCD
General Obligation Bonds	☒	• Finance
Special Tax and Revenue Bonds	☒	• Finance
Community Development Block Grants (CDBG)	☐	

Table A-18
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒	CCIL, CERV, CERT, SPCA, etc.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒	• OES Monterey County OES has full-time Community Resilience Planner focused on outreach and education.
Natural disaster or safety related school programs	☒	• Sherriff's Office • MCOE Run, Hide, Fight Program, General disaster preparedness education
Public-private partnership initiatives addressing disaster-related issues	☐	

Table A-19
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	Yes	5	10/1/2020
ISO Public Protection Classification	-	-	-
StormReady Certification	Yes		8/2/2018
TsunamiReady Certification	Yes		8/2/2018
Firewise Communities Certification	Community of Robles del Rio Community of Rancho Tierra Grande		

Political Capability

The Monterey County Board of Supervisors has outlined their vision for the long-term development and health and safety of the community in the Strategic Plan.

A.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table A-20

National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Josh Bowling, Chief of Building Services
NFIP Community Number:	060195
Flood Insurance Policies in Force:	1,277
Insurance Coverage in Force:	\$362,723,300
Written Premium in Force:	\$1,732,791
Total Loss Claims:	1,163
Total Payments for Losses:	\$23,735,682
Adopted Regulations that meet NFIP Requirements:	
Chapter 16.16 - REGULATIONS FOR FLOODPLAINS IN MONTEREY COUNTY Ord. No. 5139, § 1, adopted October 6, 2009, amended Chapter 16.16 in its entirety to read as herein set out. Formerly, Chapter 16.16 pertained to similar subject matter, and derived from Ord. No. 2966, adopted 1984; Ord. No. 3152, §§ 1—5, adopted 1986; Ord. No. 3272, adopted 1987; Ord. No. 3568, adopted 1991, and Ord. No. 3876, adopted 1996.	
Date of last NFIP Community Assistance Visit (CAV):	
Unknown.	
Higher standards that exceed minimum NFIP requirement:	
- MC Code, Chapter 16.16, requires 1.0 ft freeboard - Monterey County ensures building codes standards are enforced for protection against differential settling, scour/erosion, and positive drainage for building foundations and ground surface within 10 ft of any structure. MC Chapter 18 – Buildings and Construction, Ord. No. 5337 adopted the 2019 California Building Standards Code (BCSC) with County amendments. BCSC Section 1803.5.8 and 1804.4 which include all buildings on compacted fill be protected from erosion and scour (but no compensatory storage); BCSC Sections 1803 and 1805 have positive foundation drainage requirements; BCSC Appendix J, § J109 has drainage and terracing requirements for earthwork involving cuts and fills. - MC Code, Chapter 16.16 enforces cumulative substantial improvement regulations - Monterey County regulates development along the shoreline for coastal erosion protection. Section 30253 of the California Coastal Act is the key policy that applies to new development and why MC addresses coastal erosion hazards. - Bluff top and shoreline set-back requirements are based on coastal erosion rates established in various Local Coastal Programs (LCP) to help minimize coastal hazards. For example, the LCP within MC typically use a 50-year economic lifetime setback, approximately 40 to 50 feet from a designated setback point (either bluff top or point of maximum wave run-up). To determine the 50-year economic lifetime setback, the average coastal erosion rates are evaluated.	
Additional floodplain management provisions:	
Monterey County's 2010 General Plan, Safety Element:	
S-1.6 prohibits development in areas of (a) moderate or high relative landslide susceptibility, (2) high relative erosion susceptibility, (c) moderate or high relative liquefaction susceptibility, (d) coastal erosion and sea cliff retreat, or (e) tsunami run-up hazards.	

Table A-20
National Flood Insurance Program (NFIP) Compliance

- S-2 reduces the amount of new development in floodplains and, for any development that does occur, minimize the risk from flooding and erosion.
- S-3 ensures effective storm drainage and flood control to protect life, property, and the environment.
- S-5 assures the County is prepared to anticipate, respond, and recover from emergencies.

Floodplain management activities performed that go beyond FEMA minimum requirements:

- MC Environmental services in coordination with MC Information Technology department maintain a Geographic Information System (GIS) map of the County's drainage system and the MC Public Works department and MC Water Resources Agency (RMA) provide maintenance and clearing of the drainage system.
- MC WRA maintains the ALERT2 flood warning system.
- Monterey County's public education or outreach activities related to promoting flood risk awareness, risk reduction, and the availability of flood insurance are performed by the HCD, Public Works, WRA, the Monterey County OES, the Monterey Regional Stormwater Management Program (MRSWMP). Examples of outreach activities include:
 - o Annual flood preparedness mailers and print ads in local newspapers
 - o "Do Not Dump – Drains to the river where fish live" stencils next to storm drain inlets in the urbanized storm water boundary for MRSWMP
 - o Social media Twitter and Facebook posts from OES, HCD, and Public Works
 - o MRSWMP school outreach (K-12) classroom presentations and assemblies
 - o Our Water Our World flyers and in-store events in local Home Depot stores

Existing impediments to running an effective NFIP program:

The only difficulty is identifying resources for the program.

Specific actions that are ongoing or considered related to continued compliance with the NFIP:

- Develop a checklist for review of building/development permit plans and for inspection of development in floodplains.
- Establish a goal to have each plan reviewer and building inspector attend training periodically.
- Sponsor a periodic NFIP workshop for local surveyors and builders.
- Hold informative work sessions for newly elected officials and new appointees to planning commissions and appeals/variance boards, to provide an overview of floodplain management, the importance of participating in the NFIP, and the implications of failing to enforce the requirements of the program or failing to properly handle variance requests.
- Obtain FEMA's Substantial Damage Estimator and attend training to be prepared to use it when damage occurs; develop mutual aid agreements with other jurisdictions to augment local inspection personnel after major disasters.
- Develop handouts for permit applications on specific issues such as installation of manufactured homes in flood hazard areas according to HUD's installation standards, or guidance on improving/repairing existing buildings to better withstand potential hazards.

A.6.2 SELF-ASSESSMENT OF CAPABILITY

Table A-21
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	High
Administrative and Technical Capability	Moderate
Fiscal Capability	Limited
Education and Outreach Capability	Moderate
Political Capability	Moderate
Overall Capability	Moderate

A.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

A.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the County made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The County will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new

possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.

- **Building Code:** The County's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the County's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance
- **Salinas River Management Program:** This program approved over the previous performance period incorporates the principles of hazard mitigation and provides a comprehensive river ecosystem and flood mitigation planning and restoration program for the river vegetation and channel.
- **Community Resilience Plan:** The Monterey County Community Resilience Plan is a countywide framework outlining the challenges and opportunities to building a more resilient Monterey County. This Plan incorporates the hazard mitigation plan into its framework.
- **Monterey County Operational Area Emergency Operations Plan:** The Emergency Operations Plan addresses the County's responsibilities in emergencies associated with natural disaster, human-caused emergencies and technological incidents. It provides a framework for coordination of response and recovery efforts within the operational area in coordination and with local, State, and federal agencies. The Plan establishes an emergency organization to direct and control operations during a period of emergency by assigning responsibilities to specific personnel. Information from the hazard mitigation plan is incorporated as appropriate.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. Monterey County, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. Monterey County will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs to be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments

- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

A.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, Unincorporated Monterey County Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for Unincorporated Monterey County are identified below:

- Overgrown vegetation and sediment build-up in the Carmel River and Salinas River channels have increased the potential for destructive flooding and vegetation fires for many communities in Monterey County.
- Multiple low-lying communities in the County near rivers and water bodies, such as the Pacific Ocean, the Elkhorn Slough, the Pajaro River, the Salinas River, the Carmel River, and the Carmel Lagoon, are susceptible to flooding and flood damage.
- Following a significant earthquake critical infrastructure, such as the Natividad Medical Center, may experience structural damage and service interruptions that pose risks to the public.
- The water and wastewater infrastructure for the unincorporated communities of Castroville, San Lucas, and San Ardo is not mapped and deemed particularly vulnerable to unmitigated losses.
- Due to the topography and terrain of unincorporated areas, telecommunications and radio communications can be extremely limiting to first responders and residents during emergencies.
- The extensive inventory of roads in moderate to high-risk wildfire areas which require annual vegetation maintenance exceed the County's current capability.
- The Nacimiento Reservoir Dam Spillway is eroding at a concerning rate.
- While flooding already poses a risk in Monterey County, rising seas will put new areas at risk and increase the likelihood and intensity of floods in areas already at risk. Sea level rise poses a threat to various communities in Monterey, including Moss Landing and the Carmel Lagoon, as well as several natural habitats, such as the Elkhorn Slough. Additionally, agriculture in the Salinas Valley is incredibly vulnerable to sea level rise, with approximately 15,000 acres of agricultural land less than 10ft above the current mean sea level elevation.

A.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The Unincorporated Monterey County Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the County's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table A-23* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the County during the planning process. *Table A-22* includes the status of actions completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the County added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table A-22
Unincorporated Monterey County Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
2	Develop a sustained public outreach program that encourages consistent hazard mitigation content. For example, consider publishing tsunami inundation maps in telephone books, wildland fire defensible space tips with summer water bills, and the safe handling and disposal of hazardous waste and chemicals with garbage bills.	Completed	Completed as part of MJHMP update
3	Review and update County inundation maps every five years and participate in DSOD mapping updates.	Completed / Ongoing	Completed and maps will continue to be reviewed and updated as required.
4	Examine and mitigate critical infrastructure that has been identified as currently being too narrow to ensure the safe transportation of truck loads within Monterey County.	Deleted	Major throughfares in the County meet this standard.

Table A-22
Unincorporated Monterey County Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
6	Include provisions for dust erosion control methods in building, grading, and land clearing permits.	Completed	Permit applications include and require these provisions.
11	Conduct bi-annual core capability assessments of Monterey County public safety agencies.	Completed / Ongoing	This item has been removed from future mitigation actions since it is a sustainable implementation practice.
13	Implement Business Operations Center and Private Sector Advisory Committee to ensure private/public partnerships.	Deleted	Staff time and resources are not available for implementation.
15	Require and maintain safe access for fire apparatus to wildland/urban interface neighborhoods/properties, and defensible space around structures.	Complete/ Ongoing	Roads meet current state standards for fire apparatus access and safe access will continue to be maintained. Defensible space is covered in other actions listed below.
18	Create and fund positions to support the Fire Warden and Fuel Mitigation Officer.	Partially Completed	The County funded RCDMC as Fuel Mitigation Officer. Fire Warden included in new action.
19	Support outreach and education programs, in conjunction with fire authorities having jurisdiction.	Complete/ Ongoing	The County does and will continue to support outreach and education programs in conjunction with fire authorities.
20	Salinas River Management Program will provide a comprehensive river ecosystem and flood mitigation planning and restoration program for the river vegetation and channel.	Completed / Ongoing	Permits have been obtained for the Salinas River Stream Maintenance Program and this is ongoing
21	Elkhorn Slough Road Improvement: develop plan to improve circulating tidal waters, emergency access that Elkhorn Road is currently blocking during periods of king tides and future sea level rise.	Deleted	Long term mitigation for this road will not occur and the County is not familiar with this project.

Table A-23
Unincorporated Monterey County Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing	All	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures, as necessary.	Moderate	Public Works	General Fund, Grants
2	Ongoing	Wildfire	Continue to conduct fuel management programs and investigate and apply new and emerging fuel management techniques. Create and maintain community fuel breaks and other fuel management projects. Use prescribed burning to reduce fuel loads that threaten public safety and property, and to manage for ecological values and functions.	Priority / High	Public Works, RCDMC	General Fund, Grants, California Fire Safe Council
3	In Progress	Flooding	Implement the Carmel River Floodplain Restoration and Environmental Enhancement (CRFREE) Project	Priority / High	Public Works	General Fund, HMGP Grants
4	Ongoing	Flooding	Work with property owners subject to flood losses to implement property protection activities including constructing retaining walls, berms, and terrace drains, as well as installing debris fences and high-capacity pumping ability. Additionally, work with property owners to elevate structures such that the lowest habitable floor is a minimum of 1-foot above the base flood elevation.	Priority / High	HCD	General Fund, HMGP Grants
5	In Progress	All, Climate Change	Develop and implement a multi-hazard public awareness program to include risks of sea level rise and climate change impacts.	Moderate	OES, HCD Sustainability	General Fund, Grants
6	5-Year Timeframe	All, Earthquake, Wildfire	Develop a debris management plan.	Low/ Moderate	Public Works, Environmental Health, OES	General Fund
7	Ongoing	Drought	Encourage water conservation measures to home and business owners through public awareness outlets.	Moderate	OES	General Fund

Table A-23
Unincorporated Monterey County Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
8	In Progress	Tsunami	Develop and implement new tsunami evacuation and maritime response playbooks to improve decision making for protective actions that are specific for local jurisdictions and coastal effects. Utilize maritime playbooks to determine where maritime facilities and infrastructure in Moss Landing Harbor can be strengthened.	High	OES, Cal OES and CGS Tsunami Steering Committee	State and Federal Tsunami Funding
9	Ongoing	Flooding	Continue to implement the Salinas River Steam Maintenance Program in order to reduce risk and seek flood control solutions along the Salinas River.	Moderate	MCWRA, RCDMC	General Fund, MCWRA Enterprise Fund, Grants, Private
10	New	All	Update the safety element of the Monterey County General Plan and adopt the MJHMP.	High	HCD	General Fund
11	Ongoing	Earthquake	Consider seismic requirement updates to the Monterey County Building Code.	Moderate	HCD	General Fund
12	In Progress	Climate Change	Complete the County's Climate Action Plan and incorporate climate adaption.	High	Sustainability, OES	General Fund, Grants
13	New	Wildfire	Create and fund the position of County Fire Warden.	Moderate	HCD	General Fund
14	New	Flooding	Assess solutions to flood control issues along the Pajaro River.	Moderate	MCWRA, HCD, Public Works, Santa Cruz County	General Fund, MCWRA Enterprise Fund, Grants
15	New	Dam Failure	Implement the Nacimiento Dam Spillway Plunge Pool Erosion Mitigation Project.	High	MCWRA	MCWRA Enterprise Fund, HMGP Grants
16	New	Dam Failure	Install a new low-level flow control valve on the Nacimiento Dam.	High	MCWRA	MCWRA Enterprise Fund, HMGP Grants

Table A-23
Unincorporated Monterey County Hazard Mitigation Action Plan Matrix

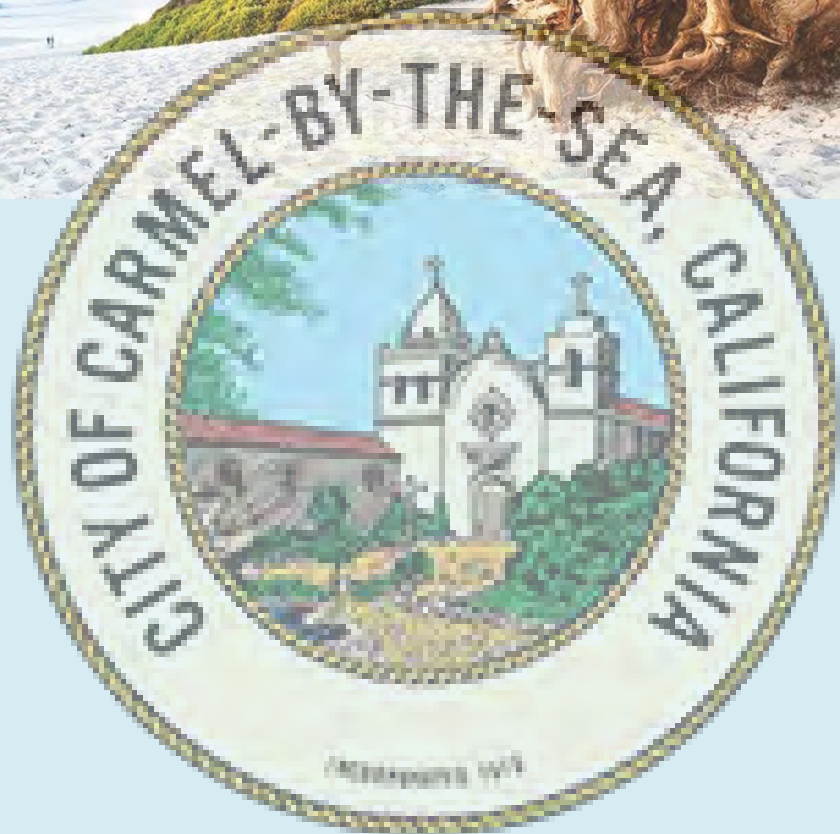
Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
17	New	Dam Failure	Implement the San Antonio Dam spillway rehabilitation or replacement project.	High	MCWRA	MCWRA Enterprise Fund, HMGP Grants
18	New	Dam Failure	Complete low-level outlet repairs on the San Antonio Dam.	Moderate	MCWRA	MCWRA Enterprise Fund, HMGP Grants
19	New	All	Create a standardized post-disaster rebuilding ordinance.	Moderate	HCD	General Fund
20	New	Wildfire	Streamline the fuel reduction permitting process.	Moderate	HCD	General Fund
21	New	Wildfire	Consider opportunities to work with private property owners to implement hazardous fuels reduction and ignition resistant construction projects	Moderate	OES	General Fund, HMGP Grants, Private Funding
22	New	Wildfire	Continue to work cooperatively with public agencies with responsibility for fire protection	Moderate	OES, HCD	General Fund, HMGP Grants,
23	New	Wildfire	Locate, when feasible, new essential public facilities outside of high fire risk areas, including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities, or identify construction or other methods to minimize damage if these facilities are located in a state responsibility area or very high fire hazard severity zone	Moderate	HCD	General Fund, HMGP Grants,
24	New	Wildfire	Avoid and/or minimize the wildfire hazards associated with new uses of land. Design adequate infrastructure if a new development is located in a state responsibility area or in a very high fire hazard severity zone, including safe access for emergency response vehicles, visible street signs, and water supplies for structural fire suppression.	Moderate	HCD	General Fund, HMGP Grants

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ANNEX B: CARMEL-BY-THE SEA



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



B. CITY OF CARMEL-BY-THE-SEA

B.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

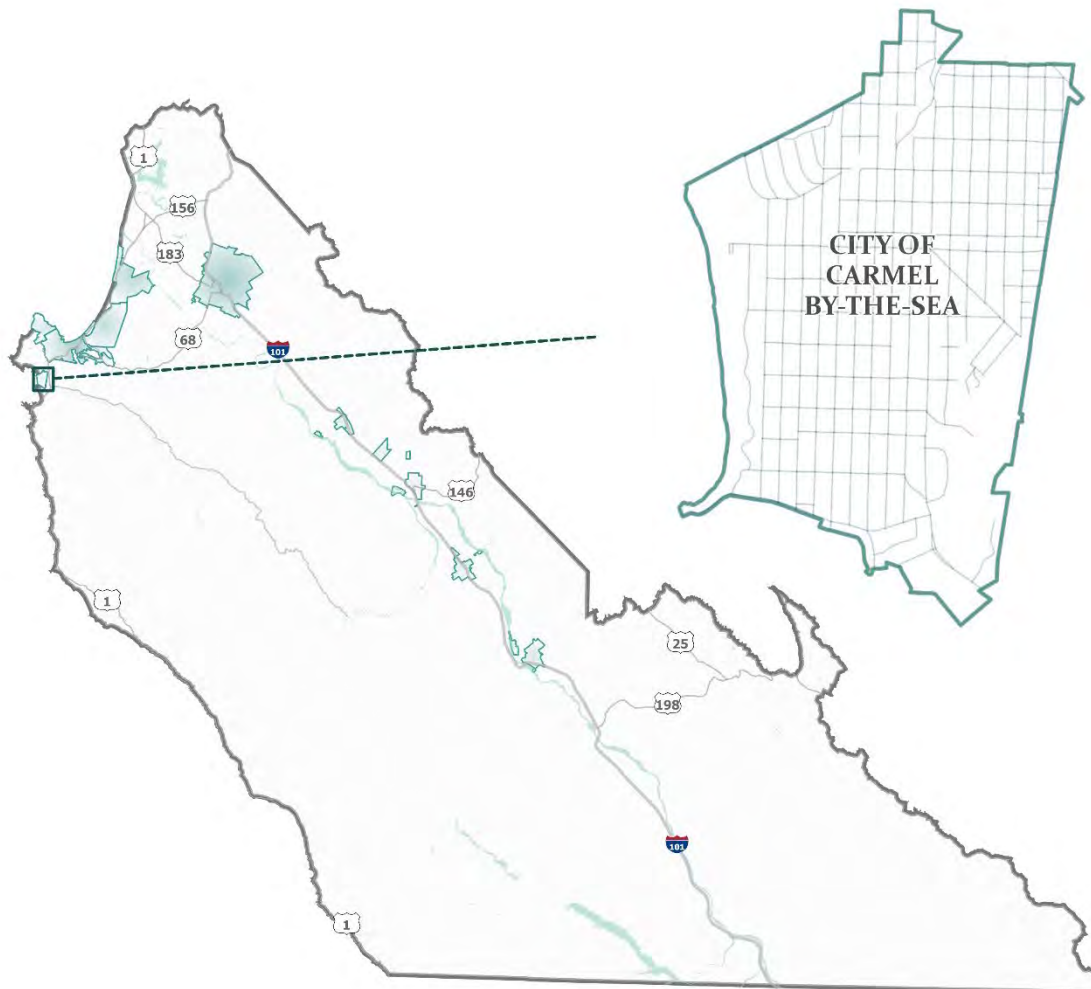
Brandon Swanson
Director of Community Planning and Building
Community Planning and Building Department
Monte Verde Street
Carmel, CA 93923
(831)-620-2024
bswanson@ci.carmel.ca.us

Alternate Point of Contact

Gaudenz Panholzer
Fire Chief
Monterey Fire Department
610 Pacific Street
Monterey, CA 93940
(831) 646-3900
panholzer@monterey.org

B.2 COMMUNITY PROFILE

B.2.1 LOCATION



B.2.2 GEOGRAPHY AND CLIMATE

Carmel-by-the-Sea is primarily a residential community on the Monterey Peninsula covering approximately one square mile in area. It is a densely forested city with a popular commercial district that attracts tourists and visitors to California's central coast from near and far. The city, known for its natural scenery and rich artistic history. Carmel-by-the-Sea experiences a cool summer Mediterranean climate. Summers are typically mild, with overcast mornings produced by marine layer clouds which can bring drizzles that typically give way to clear skies in the afternoon.

B.2.3 HISTORY

Mission San Carlos Borromeo de Carmelo was founded on 3 June 1770 in the nearby settlement of Monterey but was relocated to Carmel Valley by Junípero Serra due to interactions between soldiers stationed at the nearby Presidio and the native populations. A welder, John Martin, acquired lands surrounding the Carmel Mission in 1833, which he named Mission Ranch.

Known as "Rancho Las Manzanitas", the area that was to become Carmel-by-the-Sea was purchased by French businessman Honore Escolle in the 1850s. Escolle was well known and prosperous in the City of Monterey, owning the first commercial bakery, pottery kiln, and brickworks in Central California. In 1888, Escolle and Santiago Duckworth, a young developer from Monterey with dreams of establishing a Catholic retreat near the Carmel Mission, filed a subdivision map with the County Recorder of Monterey County. By 1889, 200 lots had been sold. Abbie Jane Hunter first used the name "Carmel-by-the-Sea" on a promotional postcard. In 1902 James Frank Devendorf and Frank Powers, on behalf of the Carmel Development Company, filed a new subdivision map of the core village that became Carmel. The Carmel post office opened the same year. Carmel-by-the-Sea incorporated in 1916.

In 1905, the Carmel Arts and Crafts Club was formed to support and produce artistic works. After the 1906 San Francisco earthquake the village was inundated with musicians, writers, painters, and other artists turning to the establishing artist colony after San Francisco was destroyed. The Carmel Arts and Crafts Club held exhibitions, lectures, dances, and produced plays and recitals at numerous locations in Carmel, including the Pine Inn Hotel, the Old Bath House on Ocean Ave, the Forest Theater, a small building in the downtown area donated by the Carmel Development Company, and finally, purchasing their own lot on Casanova Street, where they built their own clubhouse in 1907.

B.2.4 POPULATION

The City of Carmel-by-the-Sea has a population of 3,220 people (2020 Census), a 13% decrease since 2010.

B.2.5 GOVERNING BODY FORMAT

The City of Carmel-by-the Sea is a General Law city. The City Council consists of an elected Mayor holding a two-year term and four Council Members elected at large for four-year staggered terms. The Mayor and City Council appoint the City Administrator.

B.2.6 ECONOMY AND TAX BASE

The City is primarily residential, with Tourism and the Arts as its major industries. Retail trade and other businesses oriented toward visitors, including many inns and hotels, art galleries, boutiques, restaurants, and other small businesses drive the primary economic activity in the City.

B.3 PLANNING PROCESS

The City of Carmel-by-the-Sea followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Carmel-by-the-Sea held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on June 15, 2021. Key stakeholders present at the meeting included:

- Chip Rerig, City Administrator
- Paul Tomasi, Director of Public Safety/ Chief of Police
- Robert Harary, Director of Public Works
- Wanda Vollmer, Team Captain Carmel CERT
- Brandon Swanson, Director of Community Planning and Building
- Rob Culver, Public Works Superintendent
- Gaudenz Panholzer, Fire Chief
- Ashlee Wright, Library and Community Activities Director
- Scot Smythe, Team Captain Carmel CERT
- Jeff Watkins, Admin Sergeant

B.4 LAND USE AND DEVELOPMENT

The Carmel General Plan was adopted in 2003 and their Local Coastal Program was certified in 2004. The General Plan was combined with its Local Coastal Land Use Plan to ensure coordination of the two policy documents. All of the incorporated City is located in the Coastal Zone. Carmel is a small coastal community with a residential village character. Early development was predominantly residential and commercial development was originally small-scale, designed to serve the needs of the local residents. Over the years, commercial uses have expanded to cater largely to visitors.

Little development is expected as the City is generally considered “built-out” with very little buildable vacant land. The land use pattern within the City of Carmel-by-the-Sea is well established and unlikely to change. The predominant land use in the City is residential (approximately 55%), and most of the residences are single-family dwellings. The City’s Commercial District accounts for approximately 6% of the land area in the City. No land is designated for industrial use. The City limits include a significant amount of land devoted to parks and beaches (approximately 10%), including Carmel Beach Park, Mission Trail Nature Preserve, Devendorf Park, Piccadilly Park, First Murphy Park, and Forest Hill Park.

The City's land use policies focus on maintaining the predominance of the residential character in the City through appropriate zoning and land development regulations in all districts.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The Carmel Safe Growth Survey was completed by Brandon Swanson, Director of Community Planning and Building and Robert Harary, P.E., Director of Public Works for the City of Carmel-by-the-Sea. The results are summarized in *Table B-1*.

Table B-1
City of Carmel-by-the-Sea Safe Growth Survey Results

Topic Area	2021	2016
Land Use	2.8	4.3
Transportation	3.7	3.0
Environmental Management	4.3	5.0
Public Safety	3.0	4.7
Zoning Ordinance	1.8	4.5
Subdivision Regulations	3.3	2.3
Capital Improvement Program & Infrastructure Policies	4.0	3.7
Building Code	2.0	3.0
Economic Development	5.0	4.0
Average Survey Ratings	3.3	3.8

B.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Carmel-by-the-Sea's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to City of Carmel-by-the-Sea's is included in this Annex.

CITY OF CARMEL-BY-THE-SEA Multi-Jurisdictional Hazard Mitigation Plan

The City of Carmel-by-the-Sea's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table B-2* displays the results of the hazard risk ranking exercise that was performed by the City of Carmel-by-the-Sea's Planning Team.

Table B-2
Threat Hazard Identification Risk Assessment (THIRA): City of Carmel-by-the-Sea

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	1.2	1.2	1.3	1.4	5.2	Slight
Coastal Erosion	3.0	2.8	2.7	3	11.5	Substantial
Coastal Flooding	2.4	2.7	2.0	2.3	9.4	Moderate
Cyber-Attack	2.9	2.6	3.0	3.3	11.8	Substantial
Dam Failure	1.3	1.1	1.1	1.4	5	Slight
Drought & Water Shortage	3.6	3.7	3.1	3.1	13.5	High
Earthquake	3.4	2.8	3.4	3.6	13.2	High
Epidemic	3.4	2.9	3.3	3.7	13.3	High
Extreme Cold & Freeze	1.8	1.8	2.1	2.1	7.8	Possible
Extreme Heat	2.2	2.0	2.0	2.3	8.6	Moderate
Flash Flood	2.0	2.0	2.2	2.4	8.7	Moderate
Hazardous Materials Incident	2.6	2.1	2.1	2.6	9.3	Moderate
Invasive Species	3.0	2.7	2.6	2.3	10.6	Substantial
Levee Failure	1.6	1.3	1.7	1.6	6.1	Possible
Localized Stormwater Flooding	3.0	2.7	2.9	2.9	11.5	Substantial
Mass Migration	1.3	1.3	1.6	1.6	5.8	Slight
Pandemic	3.4	3.0	3.8	3.8	13.9	High
Riverine Flooding	2.0	2.1	2.0	2	8.1	Moderate
Sea Level Rise	2.8	3.1	2.6	3	11.5	Substantial
Severe Winter Storms	2.9	2.8	2.5	2.6	10.8	Substantial
Slope Failure	2.5	2.5	2.4	2.5	9.9	Moderate
Targeted Violence	2.0	2.5	2.5	2.7	9.7	Moderate
Terrorism	2.2	1.0	3.0	3.3	9.5	Moderate
Tsunami	2.8	2.5	2.9	3	11.1	Substantial
Utility Interruption/ PSPS	3.5	3.5	3.0	3.3	13.3	High
Water Contamination	3.0	2.3	3.3	3.0	11.6	Substantial
Wildfire	3.8	3.1	3.4	3.8	14	High
Windstorms	3.4	3.4	3.0	3.1	12.9	High

B.5.1 AGRICULTURAL EMERGENCIES

There is no agricultural land located within the City, so therefore an agricultural emergency does not pose a direct threat. Since agriculture is a major economic driver in the County, an agricultural emergency could have indirect economic impacts on the City.

B.5.2 COASTAL EROSION

To determine coastal erosion risk, USGS Pacific Coastal and Marine Science Center Coastal Storm Modeling (CoSMos) shoreline change, and cliff retreat projection data was used. For cliff retreat modeling an end of century (2100) forced sea level rise amount of 200 cm was used based on Ocean Protection Council (OPC) High Risk Aversion Guidance. For shoreline change, winter erosion uncertainty modeling was used to capture the degree of uncertainty associated with future shoreline erosion. Hold the Line scenario modeling was chosen for both types of erosion. Three sea level rise levels (25 cm, 75 cm, and 200 cm) to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Table B-3 summarizes population and property exposure to coastal erosion risk.

Table B-3 Population and Property Exposed to Coastal Erosion Risk in Carmel-by-the-Sea					
Sea Level Rise Scenario/ Erosion Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Cliff Erosion					
Sea Level Rise (25 cm)	34	4	\$58,980,750	4	\$857
Sea Level Rise (75 cm)	34	4	\$58,980,750	4	\$857
Sea Level Rise (200 cm)	34	4	\$58,980,750	4	\$857
Shoreline Erosion					
Sea Level Rise (25 cm)	0	0	\$0	0	\$0
Sea Level Rise (75 cm)	0	0	\$0	0	\$0
Sea Level Rise (200 cm)	0	0	\$0	0	\$0

Erosion on sloped inland areas and at the shoreline has been a problem for Carmel. Erosion of the beach bluffs is addressed in the City's Shoreline Management and Emergency Operations plans.

B.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in a mapped dam inundation zone of any of the dams (Nacimiento, San Antonio, Los Padres, and Forest Lake) analyzed in this Plan.

Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

B.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

B.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree.

Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 3,377 residential and non-residential buildings in the City, with a total value of \$4,762,701,075. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table B-4* summarizes population and property in the City exposed to liquefaction risk.

Table B-4
Population and Property Exposed to Liquefaction Risk in Carmel-by-the-Sea

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	589	129	\$314,606,407	30	\$15,820,742
Moderate Liquefaction Susceptibility	43	1	\$2,930,757	2	\$4,395,452

B.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table B-5* summarizes population and property in the City in the 100-year and 500-year floodplain. Only a small portion of the City's southern tip is designated as a FEMA 100-year Flood Zone. Mission Fields, a residential area, is within the 100-year floodplain, as are the Carmel Center/Carmel Rancho shopping centers.

Table B-5
Population and Property Exposed to Flooding Risk in Carmel-by-the-Sea

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	14	3	\$44,702,609	7	\$4,396,309
500-Year Flood Zone	22	2	\$17,454,593	0	\$0

There is also a high level of risk of localized stormwater flooding after major rain events. There are several areas of the City, which have been identified as being prone to localized flooding. The main area subject to localized flooding is located within the Mission Trail Nature Preserve. The City's Storm Drain Master Plan identified citywide problems, with much of the City's drainage infrastructure identified as only designed to handle 10-year storm event.

Historically, the City's stormwater system has had sufficient capacity to accommodate a rainfall of up to two inches a week. However, several factors, such as an increased amount of debris and reduced ability for maintenance affect stormwater system capacity. The stormwater systems are maintained regularly, however, during storm events the maintenance often cannot keep up with the amount of debris entering the system. As a result, the system experiences serious failures during rainfall of approximately 10 inches in a week.

Carmel Beach is subject to flooding during high tide and beach sand is lost yearly during winter storms. The beach is a clearly separated from adjacent roads and houses by a moderately steep hill, therefore, due to that topographical feature, the coastal flooding rarely extends past the beach.

B.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table B-6 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table B-6**Population and Property Exposed to Hazardous Materials Incident Risk in Carmel-by-the-Sea**

Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	3,451	2,441	\$3,786,046,381	883	\$691,543,641
Fixed Source	0	0	\$0	0	\$0

The City of Carmel-by-the-Sea has no facilities for permanent storage or transfer of hazardous waste. The City has no industrial zone or zoning district compatible with a hazardous waste site. The City is not in the vicinity of any pipeline, nor on the route of an airline transporting potentially hazardous materials. As such the most probable exposure would be due to transport of hazardous materials on state highways.

Proximity to Highway 1 is the largest hazardous materials concern for the City. A portion of the City located east of Junipero Avenue is located within the one-mile hazards corridor along Highway 1. Residents and structures located within this buffer would potentially be exposed to hazardous materials if there was an incident during transport of such materials on Highway 1. The City has a steep grade down to the ocean and a big spill from the Highway could move quickly and would be hard to contain.

B.5.8 HUMAN-CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

B.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

B.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City are likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts. FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table B-7*.

Table B-7
Annualized Frequency and Exposure to Severe Weather Events in Carmel-by-the-Sea

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.19	Frequency (<i>Distinct Events</i>)	0.03
Exposed Population	3,715	Exposed Population	3,715
Exposed Building Values	\$1,118,991,000	Exposed Building Values	\$1,118,991,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$175
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	0.08	Frequency (<i>Distinct Events</i>)	0.88
Exposed Population	3,715	Exposed Population	3,569
Exposed Building Values	\$1,118,991,000	Exposed Building Values	\$1,078,397,319
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$18,535,687
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.36	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	3,715	Exposed Population	0
Exposed Building Values	\$1,118,991,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$160	Expected Annual Loss of Building Value	\$0

Source: FEMA National Risk Index

B.5.11 SLOPE FAILURE

Landslides in Carmel area historically have been caused by waterlogged soil rather than ground shaking due to an earthquake. Based on the FEMA National Risk Index, 533 people and \$168,687,758 in building value in the City is exposed to landslide risk. Additionally, the City is susceptible to earthquake induced landslides. Exposure of population and property in the City to earthquake induced landslides is summarized in *Table B-8*.

Table B-8
Population and Property Susceptible to Earthquake Induced Landslides in Carmel-by-the-Sea

Landslide Susceptibility	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High	0	0	\$0	0	\$0
Moderate	273	5	\$8,311,546	3	\$0

There are two areas historically prone to landslides within the City limits. The first area is located in the northcentral portion of the City, which encompasses the Pescadero Canyon, including portions of 2nd, 3rd, and 4th Avenues, and Camino Del Monte Avenue, between 2nd and 3rd Avenues. The second area prone to landslides is located in the eastern portion of the City and encompasses the eastern portion of the Mission Trail Nature Preserve.

B.5.12 TSUNAMI

Population and property in the City located in a mapped tsunami inundation zone is summarized in *Table B-9*.

Table B-9 Population and Property in Tsunami Inundation Zone in Carmel-by-the Sea					
Inundation Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Tsunami Inundation Zone	47	2	\$44,423,372	6	\$857

The City would be minimally affected by a moderate to extreme tsunami event. This can be accredited to coastal topography along the western boundary. The steep cliff between the Scenic Road and the beach, acts as a protective boundary during a tsunami. The relatively flat topography in the southern portion, on the other hand, lends itself to a more significant wave run-up.

B.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption. Additionally, the City has a large elderly population who would be particularly vulnerable in the event of a power outage or Public Safety Power Shut-Off.

B.5.14 WILDFIRE

For this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate. *Table B-10* summarizes population and property in very high, high, and moderate fire threat areas.

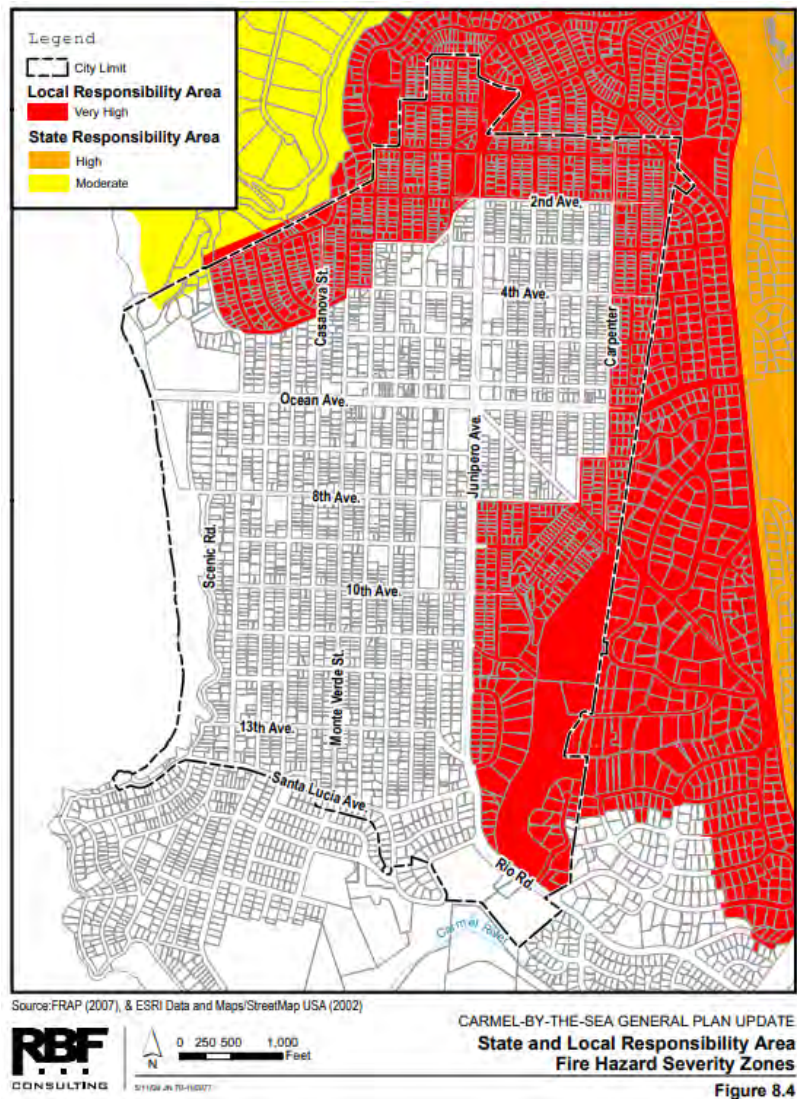
Table B-10 Population and Property Exposed to Wildfire Risk in Carmel-by-the-Sea					
CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	0	0	\$0	0	\$0
Moderate Fire Threat	3,155	1,965	\$3,077,482,448	218	\$155,375,684

Areas in the City have also been mapped as located in Fire Hazard Severity Zones (FHSZ) by CAL FIRE. These zones are designated Very High or High Fire Hazard Severity based on factors such as fuel, slope, and fire weather. Areas designated as Fire Hazard Severity Zones in the City are mapped in *Figure B-1*. Any future revisions or updates to the FHSZ maps will supersede current mapping.

Carmel's land area is largely forested and contains a significant amount of open space. There are several areas in and around the City that qualify as wildland fire hazard areas. These areas are located to the north and east of the City boundaries and include to the north, Pescadero Canyon, Forest Hill Park, and Del Monte Forest; and to east the Mission Trails Nature Preserve. The City is also located on a hillside. Steep slopes promote spread of fire and increase its speed due to preheating of vegetation. Canyons and hillsides also promote gusts of wind, which increase the unpredictable and uncontrollable nature of wildfires. The topography also creates access issues. The unimproved and narrow roads are an obstacle to fighting fires. Firefighting personnel as well as fire trucks and heavy equipment have difficulty reaching some of the City's areas. Containment being a key objective, areas of limited accessibility have a correspondingly greater potential for fire spreading.

Figure B-1

Fire Hazard Severity Zones in Carmel-by-the-Sea



Source: Carmel-by-the-Sea General Plan, [Environmental Safety Element](#)

B.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure. Drought, coastal and inland flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the rural economies, along with changes to agriculture and crops, which are a critical backbone of Monterey County's economic success. There will also be negative impacts to ecosystems, both on land and in the ocean, leading to local extinctions, migrations, and management challenges.

Sea level rise risk exposure in the City was calculated based on the NOAA Office for Coastal Management [sea level rise viewer](#) projections. Three sea level rise levels (25 cm, 75 cm, and 200 cm) were chosen to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Population and property exposed to sea level rise risk is summarized in *Table B-11*.

Table B-11
Population and Property Exposed to Sea Level Rise in Carmel-by-the-Sea

Sea Level Rise Amount	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
1 ft Sea Level Rise (2030)	0	1	\$621,268	2	0
3 ft Sea Level Rise (2060)	14	1	\$621,268	5	0
7 ft Sea Level Rise (2100)	14	2	\$44,423,372	5	0

B.6 CAPABILITY ASSESSMENT

The City of Carmel-by-the-Sea performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table B-12*
- An assessment of administrative and technical capabilities is presented in *Table B-13*
- An assessment of fiscal capabilities is presented in *Table B-14*
- An assessment of education and outreach capabilities is presented in *Table B-15*
- Classifications under various community mitigation programs are presented in *Table B-16*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section L.6.1 in *Table B-17*
- An overall self-assessment of capability is presented in Section L.6.2 in *Table B-18*

CITY OF CARMEL-BY-THE-SEA Multi-Jurisdictional Hazard Mitigation Plan

Table B-12
Planning and Regulatory Capability

Document		Department	Comments
Planning Documents			
General Plan	☒	• Community Planning & Building	Housing Element will be updated in 2023, may be opportunity to look at safety element
Capital Improvement Plan	☒	• Public Works	Have 5-year CIP that is implemented and updated on a yearly basis
Floodplain Management Plan	☒	• Public Works	New Storm Drainage Master Plan Completed
Open Space Management Plan	☒	• Public Works	Forestry Master Plan Budgeted
Stormwater Management Plan	☒	• Public Works	Have an ASBS Compliance Plan
Coastal Management Plan	☒	• Public Works	Outdated Plan
Local Coastal Program	☒	• Community Planning & Building	City has adopted LCP
Climate Action/ Adaptation Plan	☒	• Public Works • Community Planning & Building	Completed Vulnerability Report
Emergency Operations Plan	☐	• Police Department	
Continuity of Operations Plan	☐	• Police Department	
Community Wildfire Protection Plan	☐	• Fire Department	
Evacuation Plan	☒	• Fire Department • Police Department	Carmel is participating in the development of the Countywide Evacuation Plan
Disaster Recovery Plan	☐	• Police Department	
Economic Development Plan	☐		City does not have an ED office, no official ED plan in place. Work with Chamber and Visit Carmel.
Historic Preservation Plan	☒	• Community Planning & Building	Have Historic Preservation Ordinance and Historic Context Statement
Transportation Plan	☒	• Community Planning & Building • Public Works	
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	• Public Works	Municipal Code Section 15.56 – Community Floodplain
Zoning Ordinance	☒	• Community Planning & Building	

Table B-12
Planning and Regulatory Capability

Document		Department	Comments
Subdivision Ordinance	☒	• Community Planning & Building	
Site Plan Review Requirements	☒	• Community Planning & Building	Zoning ordinance being updated in 2022, could provide opportunity for additional site plan requirements
Unified Development Ordinance	☐		
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐		
Building Code	☒	• Community Planning & Building	Updated on an ongoing basis as code cycle changes
Fire Prevention Code	☒	• Fire	Carmel adopts and reinforces the latest version of the California Fire Code

Table B-13
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	• Community Planning & Building • Public Works	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	• Public Works	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	• Public Works	
Building Inspector	☒	• Community Planning & Building	
Emergency Manager	☒	• Police Department	Chief of Police is Emergency Manager (in tandem with City Administrator)
Floodplain Manager	☒	• Public Works	
Land Surveyors	☐		Contracted out
Resource development staff or grant writers	☐		
Public Information Officer	☐		

Table B-13
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Scientist(s) familiar with the hazards of the community	☐		May have members of the community with expertise in various sciences
Staff with education or expertise to assess the community's vulnerability to hazards	☒	- Community Planning & Building - Public Works	
Personnel skilled in Geographic Information Systems (GIS)	☒	- Community Planning & Building - Public Works	
Maintenance programs to reduce risk	☒	Public Works	
Warning systems/services	☒	- Police Department - Fire Department	Carmel participates with Monterey County's implementation of Everbridge (reverse 911) and Nixle
Mutual Aid Agreements	☐		Carmel participates in the Monterey County Fire Mutual Aid Plan and the California Fire Assistance Agreement

Table B-14
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	Finance	
Capital Improvements Funding	☒	Finance	
Special Purpose Taxes	☒	Finance	20-Year Measure "C" Approved
Stormwater Utility Fees	☐		
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☐		
Development Impact Fees	☒	- Finance - Community Planning & Building - Public Works - Police Department	
General Obligation Bonds	☐	Finance	
Special Tax and Revenue Bonds	☐	Finance	
Community Development Block Grants (CDBG)	☐	Finance	

Table B-15
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒ - Public Works - Police Department - Fire Department	Friends of Mission Trail Nature Preserve, Carmel Cares; Carmel has an active CERT program.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒ - Public Works - Community Planning & Building	The City has a Climate Action Committee
Natural disaster or safety related school programs	☐	
Public-private partnership initiatives addressing disaster-related issues	☒ - Public Works - Carmel Cares	Local Volunteer group called "Carmel Cares"

Table B-16
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	Yes	2	June 17, 2015
StormReady Certification	No	-	-
TsunamiReady Certification	Yes	-	-
Firewise Communities Certification	No	-	-

Political Capability

Two city council members sit on the City's Climate Change Committee/climate action and climate adaptation program.

B.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table B-17
National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Brandon Swanson, Community Planning and Building Director
NFIP Community Number:	060196
Flood Insurance Policies in Force:	29
Insurance Coverage in Force:	\$9,940,000
Written Premium in Force:	\$13,888

Table B-17
National Flood Insurance Program (NFIP) Compliance

Total Loss Claims:	3
Total Payments for Losses:	\$127,113
Adopted Regulations that meet NFIP Requirements:	
Municipal Code Section 15.56 – Community Floodplain (Adopted 2018: Ord # 2018-03)	
Date of last NFIP Community Assistance Visit (CAV):	
Unknown.	
Higher standards that exceed minimum NFIP requirement:	
None.	
Additional floodplain management provisions:	
Municipal Code Section 17.43 (Zoning Code) – Water Quality Protection Ordinance. This section has controls in place for construction BMPs to not aggravate flooding. Some measures include specific requirements (when appropriate) for things like retention ponds, restored wetlands, curbs, and gutters.	
Floodplain management activities performed that go beyond FEMA minimum requirements:	
Regular drainage system maintenance is performed by Public Works.	
Existing impediments to running an effective NFIP program:	
Unknown.	
Specific actions that are ongoing or considered related to continued compliance with the NFIP:	
- Evaluate permit application forms to determine possible modifications focused on flood hazard prevention. - Develop a checklist for review of building/development permit plans and for inspection of development in floodplains. - Establish a goal to have each plan reviewer and building inspector attend a related training periodically. - Maintain supplies of FEMA/NFIP materials to help property owners evaluate measures to reduce potential hazard damage. Make available in public buildings, local library, website, etc. and inform people who they can call to learn more information.	

B.6.2 SELF-ASSESSMENT OF CAPABILITY

Table B-18
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Moderate
Fiscal Capability	Limited
Education and Outreach Capability	Limited
Political Capability	Limited
Overall Capability	Limited

B.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

B.6.1 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City,

through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

B.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Carmel-by-the-Sea Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Carmel-by-the-Sea are identified below:

- Mission Trails Park and Pescadero Canyon are considered at particularly high risk to wildland fire, for which controlling excessive buildup of flammable vegetative material on vacant lots is an ongoing priority for the City. Other areas of primary concern include Forest Hill Park and Del Monte Forest.

- There are two areas historically prone to landslides within city limits. The first area is located in the north-central portion of the City, which encompasses the Pescadero Canyon, including portions of 2nd, 3rd, and 4th Avenues, and Camino Del Monte Avenue, between 2nd and 3rd Avenues. The second area prone to landslides is located in the eastern portion of the City and encompasses the eastern portion of the Mission Trail Nature Preserve.
- High winds associated with winter storms are a major concern for the City due to the vast amount of trees (50% tree cover) that have proven to exacerbate damage and power outages.
- The primary area of concern for coastal flooding is along Carmel Beach and within areas in proximity to Carmel Lagoon, including Mission Fields
- Localized flooding caused by drainage issues are a constant concern, as existing stormwater infrastructure is incapable of conveying runoff during heavy rainstorms or prolonged rainfall events. Storm drains also frequently become clogged with debris (pine needles, etc.) which makes the problem even worse. Primary areas of concern include the Mission Trail Nature Preserve (owned by the City and used as a park, with some on-site retention), the intersection area of Camino Real and 4th Street, and portions of 2nd Avenue along Pescadero Canyon. The Harrison Memorial Library is a critical community asset that has been flooded in the past.
- Managing large events has become increasingly difficult for public safety partners and can place a strain on lifeline resources. The City is concerned with limited ingress/egress to the community following major disaster events. Following large winter storm events, downed trees can cause a major traffic hazard in the City. This can pose a threat to first responders who are unable to deploy in order to do their job.

B.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Carmel-by-the-Sea Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table B-20* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table B-19* includes the status of action previous plan completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table B-19**City of Carmel-by-the-Sea Completed Mitigation Actions from 2016 MJHMP**

2016 Action #	Description	Status	Narrative Update
1	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary.	Completed	Completed and ongoing on an as needed basis.
2	Develop an unreinforced masonry grant program that helps correct earthquake-risk nonmasonry building problems, including chimney bracing and anchoring water heaters.	Deleted	The City does not have adequate staff resources to implement this program.

Table B-20
City of Carmel-by-the-Sea Hazard Mitigation Action Plan Matrix

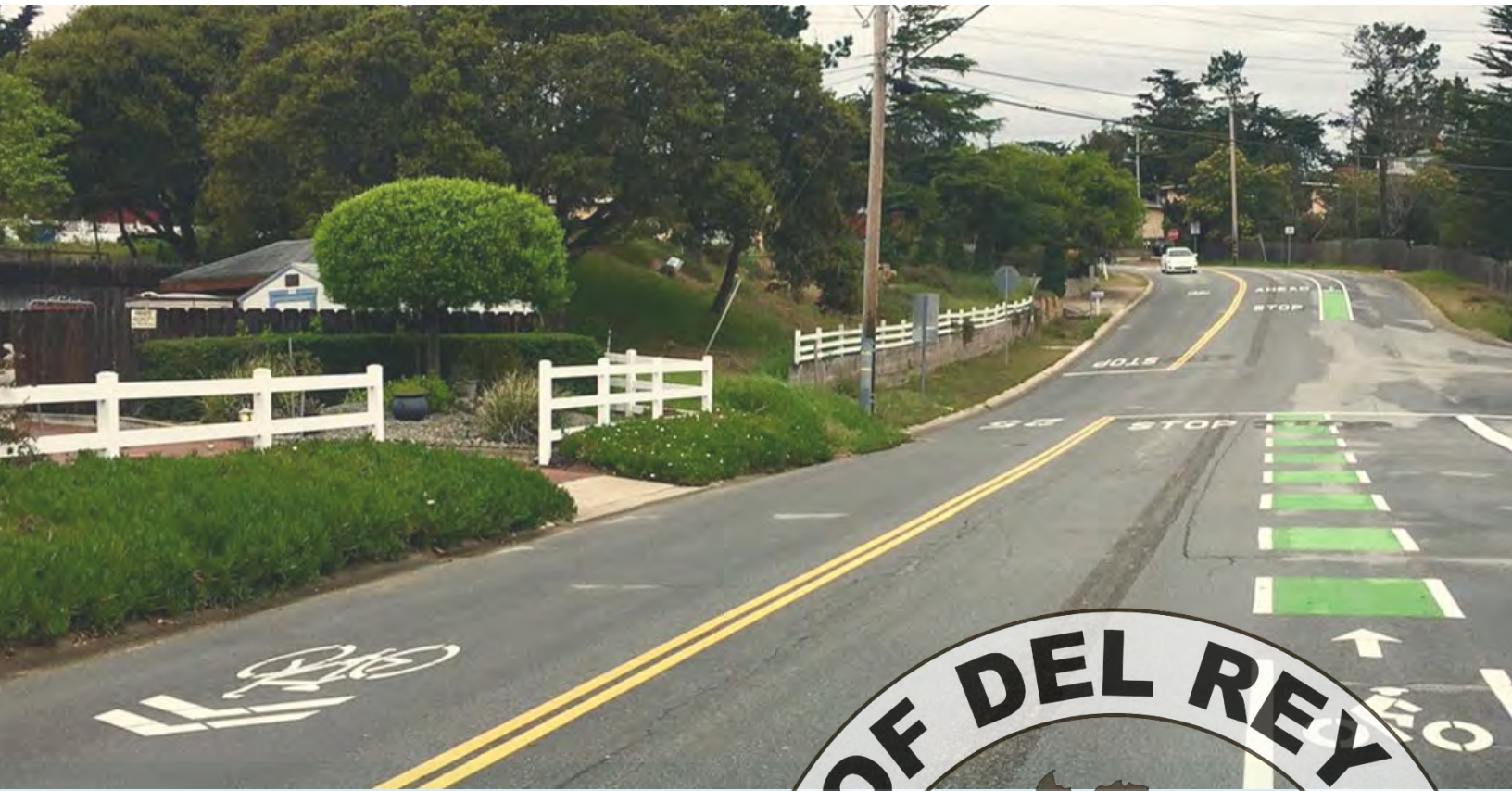
Action #	Status/Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing/Continuous	All	Continue to include hazard mitigation and disaster preparedness content in community programming and outreach materials, such as the City's Friday Letter.	Priority / High	City Administration	General Funds, HMGP, and PDM Grants
2	Ongoing/Continuous	Wildfire	Continue to conduct and support current fuel management programs and investigate, as determined feasible, and apply new and emerging fuel management techniques.	Priority / High	Fire, Public Works	General Funds and PDM Grant
3	Ongoing/Continuous	All, Utility Interruption, Severe Weather	Continue to work with the Utility Companies (especially PG&E) to build and strengthen relationships to improve communication regarding emergency situations and develop an emergency response plan that includes all emergency responders and 911 communications.	Priority / Moderate	Public Safety/Police	General Funds
4	New	Utility Interruption, Wildfire	Work with PG&E on identifying and implementing priority utility undergrounding projects in the very high fire hazard zone.	Priority / Moderate	Public Safety, Public Works	General Fund, Grants
5	Ongoing/Continuous	Earthquake, Utility Interruption, Severe Weather	Incorporate hazard-prone critical facilities and infrastructure into the City's Capital Improvement Plan and consider hazard mitigation when implementing structural and nonstructural retrofitting. Consider opportunities for seismic retrofitting and utility undergrounding in capital projects.	Priority/ High	Public Works, Planning & Building	HMGP and PDM Grants
6	New	Climate Change	Develop and implement strategies identified in the Climate Action and Adaptation Plan in order to increase the community's resiliency to climate change hazards.	Priority/ High	Planning, Public Works	General Fund, Grants
7	Ongoing/Continuous	Tsunami	Continue to participate in the NOAA National Weather Service TsunamiReady Program.	Priority/ Moderate	Public Safety	General Funds

Table B-20
City of Carmel-by-the-Sea Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
8	New	Coastal Erosion, Coastal Flooding	Conduct a Coastal engineering study to evaluate the City's revetments and other shoreline protection structures.	Priority/ High	Public Works, Planning & Building	General Fund, Grants
9	New	Coastal Erosion, Coastal Flooding	Implement the recommendations of the Shoreline Management Plan related to coastal infrastructure monitoring, maintenance, and protection.	Priority/ High	Public Works, Planning & Building	General Fund, Grants
10	In Progress	Flooding	Continue to implement the Mission Trails Nature Preserve Restoration Program, including implementation of the recommended projects of the Mission Trail Stream Stability Study.	Priority/ High	Public Works, Planning & Building	General Fund, Grants
11	In Progress	Flooding	Implement identified storm drainage improvements in the Storm Drain Master Plan to reduce the risk of localized flooding.	Priority/ High	Public Works, Planning & Building	General Fund, Grants
12	New	Flooding	Implement projects identified in the Monterey Peninsula Region Stormwater Resource Plan to increase resilience to storms over time.	Priority/ Moderate	Public Works	General Fund, Grants
13	Ongoing/ Continuous	Drought, Flooding	Continue to implement stormwater recapture efforts, which provide the dual benefit of capturing rain flow for irrigation and other purposes while increasing capacity of the existing system.	Priority/ High	Public Works, Planning & Building	General Fund, Grants
14	New	Utility Interruption, Wildfire, Severe Weather	Update the City's Zoning Code to strengthen requirements for new development to underground utilities.	Priority/ Moderate	Planning	General Fund, Grants

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ANNEX C: CITY OF DEL REY OAKS



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



C. CITY OF DEL REY OAKS

C.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

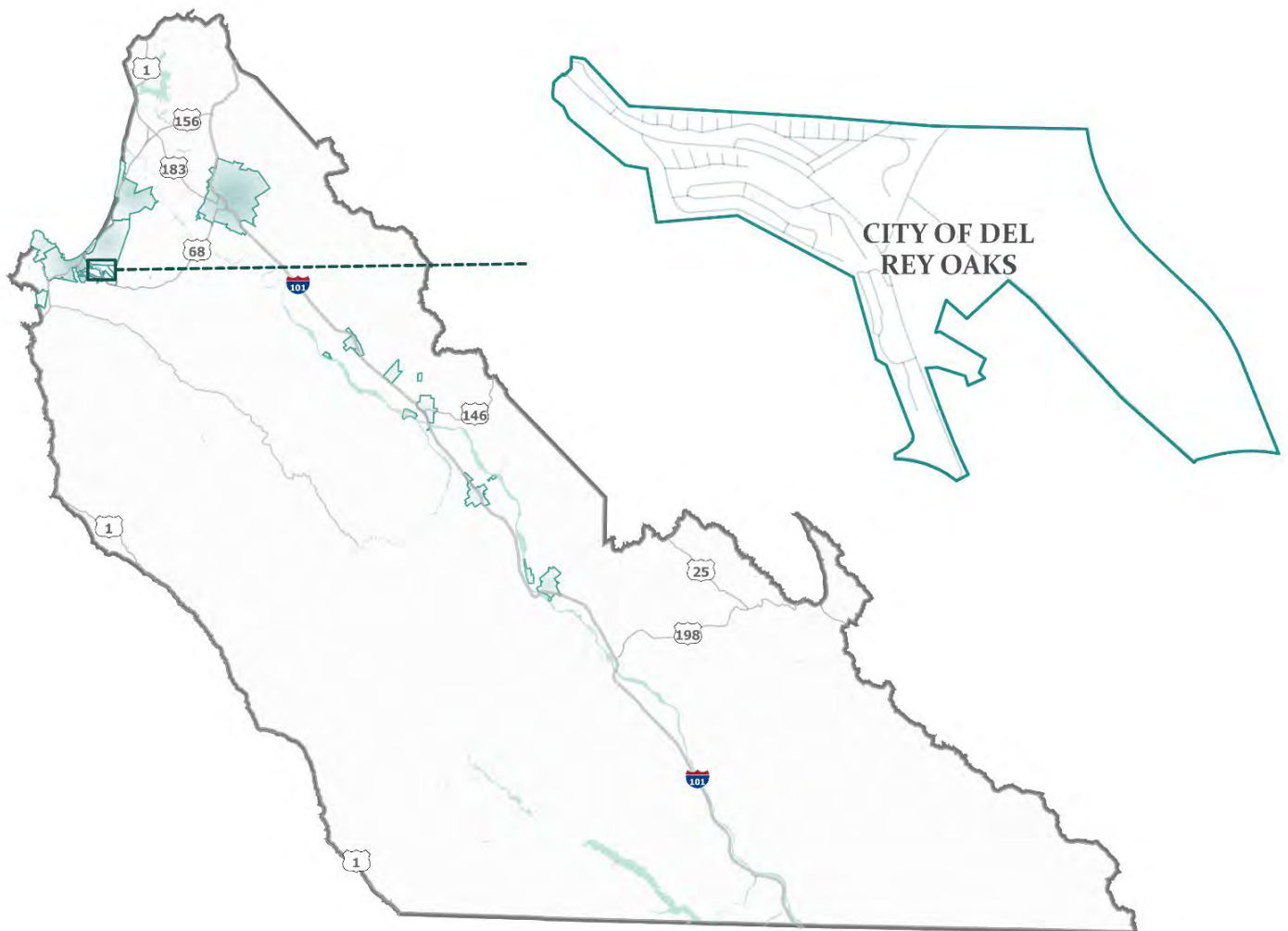
Jeff Hoyne
Chief of Police
650 Canyon Del Rey Blvd.
Del Rey Oaks, CA 93940
(831) 394-8511
JHoyne@delreyoaks.org

Alternate Point of Contact

Chris Bourquin
Police Commander
650 Canyon Del Rey Blvd.
Del Rey Oaks, CA 93940
(831) 394-8511
cberkwin@delreyoaks.org

C.2 COMMUNITY PROFILE

C.2.1 LOCATION



C.2.2 GEOGRAPHY AND CLIMATE

Del Rey Oaks is a small city, approximately half a square mile in size, nestled in a narrow-wooded canyon (Canyon Del Rey) between the cities of Seaside and Monterey. State Highway 218 forms the central spine of the community, which is primarily a “bedroom community” with most private land devoted to residential use. The city has many natural habitats including the Frog Pond, a 17-acre wetland preserve managed by the Monterey Peninsula Regional Park District, and Del Rey Park which features Old Town Hall for community events.

C.2.3 HISTORY

Prior to incorporation, the town was called Del Rey Woods. The Del Rey Oaks post office opened in 1968. The City of Del Rey Oaks was incorporated in 1953.

C.2.4 POPULATION

The City has population of 1,592 people, a slight decrease (2%) since 2010.

C.2.5 GOVERNING BODY FORMAT

Del Rey Oaks is a General Law city. The City Council consists of an elected Mayor holding a two-year term and four Council Members elected at large for four-year staggered terms.

C.2.6 ECONOMY AND TAX BASE

Del Rey Oaks is primarily a residential community. The City also received sales tax revenues from the Stone Creek Shopping Center at Highway 68 and Canyon Del Rey Road, and the Safeway at Canyon Del Rey and Fremont Boulevard.

C.3 PLANNING PROCESS

The City of Del Rey Oaks followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Del Rey Oaks held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on September 21, 2021. Key stakeholders present at the meeting included:

- John Guertin, City Manager
- Jeff Hoyne, Chief of Police
- Chris Bourquin, Police Commander
- Dave Nava, Division Chief, Seaside Fire

C.4 LAND USE AND DEVELOPMENT

The Del Rey Oaks General Plan was adopted in 1997. The City has a total land area of 295 acres, or 0.45 square miles. The City is primarily built out, except for the Fort Ord lands annexed in 1997. The City is predominately a “bedroom community” with about 40% of their land devoted to residential uses.

Recent commercial development includes the Stone Creek Village Shopping Center located at the intersection of highways 218 and 68. Significant non-residential growth is planned for the Fort Ord lands. The City will begin an update of their General Plan in the near future.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The Del Rey Oaks Safe Growth Survey was completed by all stakeholders listed above during the Mitigation Planning Meeting. The results are summarized in *Table C-1*.

Topic Area	2021	2016
Land Use	4.00	3.75
Transportation	4.33	3.33
Environmental Management	4.00	3.17
Public Safety	5.00	3.33
Zoning Ordinance	3.50	3.38
Subdivision Regulations	3.00	2.83
Capital Improvement Program & Infrastructure Policies	5.00	2.67
Building Code	5.00	3.50
Economic Development	5.00	3.00
Average Survey Ratings	4.31	3.22

C.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Del Rey Oak's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to City of Del Rey Oaks is included in this Annex.

CITY OF DEL REY OAKS Multi-Jurisdictional Hazard Mitigation Plan

The City of Del Rey Oak's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table C-2* displays the results of the hazard risk ranking exercise that was performed by the City of Del Rey Oak's Planning Team.

Table C-2
Threat Hazard Identification Risk Assessment (THIRA): City of Del Rey Oaks

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	-	-	-	-	-	-
Coastal Erosion	-	-	-	-	-	-
Coastal Flooding	-	-	-	-	-	-
Cyber-Attack	3.0	3.0	3.0	3.0	12.0	Substantial
Dam Failure	-	-	-	-	-	-
Drought & Water Shortage	3.0	3.0	3.0	3.0	12.0	Substantial
Earthquake	3.0	3.0	3.0	3.0	12.0	Substantial
Epidemic	3.0	3.0	3.0	3.0	12.0	Substantial
Extreme Cold & Freeze	-	-	-	-	-	-
Extreme Heat	-	-	-	-	-	-
Flash Flood	-	-	-	-	-	-
Hazardous Materials Incident	2.0	2.0	2.0	2.0	8.0	Possible
Invasive Species	1.0	1.0	1.0	1.0	4.0	Negligible
Levee Failure	-	-	-	-	-	-
Localized Stormwater Flooding	1.0	2.0	2.0	1.0	6.0	Slight
Mass Migration	-	-	-	-	-	-
Pandemic	3.0	4.0	3.0	3.0	13.0	High
Riverine Flooding	2.0	1.0	2.0	2.0	7.0	Possible
Sea Level Rise	-	-	-	-	-	-
Severe Winter Storms	2.0	2.0	2.0	2.0	8.0	Possible
Slope Failure	1.0	1.0	1.0	1.0	4.0	Negligible
Targeted Violence	1.0	1.0	1.0	1.0	4.0	Negligible
Terrorism	2.0	2.0	3.0	3.0	10.0	Moderate
Tsunami	-	-	-	-	-	-
Utility Interruption/ PSPS	2.0	2.0	2.0	2.0	8.0	Possible
Water Contamination	1.0	1.0	3.0	3.0	8.0	Possible
Wildfire	2.0	2.0	3.0	3.0	10.0	Moderate
Windstorms	-	-	-	-	-	-

C.5.1 AGRICULTURAL EMERGENCIES

There is no agricultural land located within the City, so therefore an agricultural emergency does not pose a direct threat. Since agriculture is a major economic driver in the County, an agricultural emergency could have indirect economic impacts on the City.

C.5.2 COASTAL EROSION

The City is not located on the coast, and therefore coastal erosion is not a major threat. Coastal erosion does threaten agricultural land in the Salinas Valley, which if impacted could have indirect economic effects on the local economy. The City could also be impacted by other types of erosion not profiled in this Plan.

C.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in a mapped dam inundation zone of any of the dams (Nacimiento, San Antonio, Los Padres, and Forest Lake) analyzed in this Plan.

Levee Failure

Based on Leveed Area from the US Army Corp of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic effect.

C.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

C.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 728 residential and non-residential buildings in the City, with a total value of \$332,512,614. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table C-3* summarizes population and property in the City exposed to liquefaction risk.

Table C-3
Population and Property Exposed to Liquefaction Risk in Del Rey Oaks

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	331	23	\$8,997,524	45	\$35,628,204
Moderate Liquefaction Susceptibility	0	0	\$0	0	\$0

C.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table C-4* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table C-4
Population and Property Exposed to Flooding Risk in Del Rey Oaks

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	331	8	\$4,376,220	51	\$40,252,457
500-Year Flood Zone	1,000	584	\$276,553,256	129	\$35,245,077

C.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table C-5 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table C-5**Population and Property Exposed to Hazardous Materials Incident Risk in Del Rey Oaks**

Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	1,000	546	\$255,848,392	139	\$55,959,358
Fixed Source	0	0	\$0	0	\$0

C.5.8 HUMAN-CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

C.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

C.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts.

FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table C-6*.

Table C-6
Annualized Frequency and Exposure to Severe Weather Events in Del Rey Oaks

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.19	Frequency (<i>Distinct Events</i>)	0.03
Exposed Population	1,624	Exposed Population	1,624
Exposed Building Values	\$224,941,000	Exposed Building Values	\$224,941,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$35
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	0.08	Frequency (<i>Distinct Events</i>)	0.88
Exposed Population	1,624	Exposed Population	1,624
Exposed Building Values	\$224,941,000	Exposed Building Values	\$224,941,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$3,927,437
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.42	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	1,624	Exposed Population	0
Exposed Building Values	\$224,941,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$43	Expected Annual Loss of Building Value	\$0
Source: FEMA National Risk Index			

C.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 1,406 people and \$200,275,934 in building value in the City is exposed to landslide risk. Exposure of population and property in the City to earthquake induced landslides is summarized in *Table C-7*.

Table C-7
Population and Property Susceptible to Earthquake Induced to Landslides in Del Rey Oaks

Landslide Susceptibility	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High	0	0	\$0	0	\$0
Moderate	292	129	\$58,655,845.00	22	\$8,670,542.00

C.5.12 TSUNAMI

The City is not located in a mapped tsunami inundation zone.

C.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption.

C.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table C-8 summarizes population and property in the City in very high, high, and moderate fire threat areas.

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	278	9	\$3,198,361	26	\$15,124,293
Moderate Fire Threat	870	155	\$75,592,991	64	\$39,098,693

C.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures will have direct impacts on public health and infrastructure. Drought, flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the local economy. There will also be negative impacts to our ecosystems, both on land and in the ocean, leading to local extinctions, migrations, and management challenges.

C.6 CAPABILITY ASSESSMENT

The City of Del Rey Oaks performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table C-9*
- An assessment of administrative and technical capabilities is presented in *Table C-10*
- An assessment of fiscal capabilities is presented in *Table C-11*
- An assessment of education and outreach capabilities is presented in *Table C-12*
- Classifications under various community mitigation programs are presented in *Table C-13*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section C.6.1 in *Table C-14*
- An overall self-assessment of capability is presented in Section C.6.2 in *Table C-15*

Table C-9
Planning and Regulatory Capability

Document		Department	Comments
Planning Documents			
General Plan	☒	• City Manager	Update underway
Capital Improvement Plan	☒	• City Manager • Public Works	
Floodplain Management Plan	☒	• Public Works	
Open Space Management Plan	☒	• City Manager	Conservation Element of the General Plan
Stormwater Management Plan	☒	• Public Works	
Coastal Management Plan	☐		N/A
Local Coastal Program	☐		N/A
Climate Action/ Adaptation Plan	☐		
Emergency Operations Plan	☒	• Police Department	
Continuity of Operations Plan	☒	• Police Department	Identified in EOP
Community Wildfire Protection Plan	☒	• Seaside Fire	
Evacuation Plan	☒	• Police Department	Multi-Hazard/ Wildfire Evacuation Plan
Disaster Recovery Plan	☐		
Economic Development Plan	☒	• City Manager • Planning Department	
Historic Preservation Plan	☐		N/A
Transportation Plan	☒	• City Manager • Planning Department	Circulation Element of the General Plan
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	• Public Works	Flood Damage Prevention Ordinance (Municipal Code 15.44)
Zoning Ordinance	☒	• Planning Department	
Subdivision Ordinance	☒	• Planning Department	
Site Plan Review Requirements	☒	• Planning Department	
Unified Development Ordinance	☐		
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐		
Building Code	☒	• Building Inspector	
Fire Prevention Code	☒	• Seaside Fire	

Table C-10
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	• Planning Department	In addition to contract planning and engineering services
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	• Building Inspector	In addition to contract planning and engineering services
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	• Building Inspector	In addition to contract planning and engineering services
Building Inspector	☒	• Building Inspector	
Emergency Manager	☒	• Police Department	Chief of Police
Floodplain Manager	☒	• Public Works	City Engineer
Land Surveyors	☒		Contract as needed
Resource development staff or grant writers	☒	• City Manager • City Clerk	
Public Information Officer	☒	• City Manager • Police Department	
Scientist(s) familiar with the hazards of the community	☐		
Staff with education or expertise to assess the community's vulnerability to hazards	☒	• Planning Department • Police Department • Seaside Fire	
Personnel skilled in Geographic Information Systems (GIS)	☒	• Monterey County	Contract as needed
Maintenance programs to reduce risk	☒	• Public Works	Annual creek maintenance, fire fuel reduction, tree clearing
Warning systems/services	☒	• Monterey County	Everbridge/ Nixle
Mutual Aid Agreements	☒	• Police Department • Seaside Fire	

Table C-11
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	• City Manager	
Capital Improvements Project Funding	☒	• Public Works	
Special Purpose Taxes	☒	• City Manager • Public Safety	Gas Tax, Public Safety Tax

Table C-11
Fiscal Capability

Fiscal Resources		Department	Comments
Stormwater Utility Fees	☐		
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☐		
Development Impact Fees	☒	• Planning Department	
General Obligation Bonds	☒	• City Manager	Could issue as needed
Special Tax and Revenue Bonds	☒	• City Manager • Public Safety	
Community Development Block Grants (CDBG)	☒	• City Manager	
Other:		• Wildfire Fuel Mitigation Grants • Parks and RTSP Grants	

Table C-12
Education and Outreach Capability

Educational and Outreach Resources		Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒	• Sustainable Del Rey Oaks	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒	• City Clerk • Seaside Fire	Outreach on website and in bi-annual city newsletter, in addition to community events
Natural disaster or safety related school programs	☐		N/A
Public-private partnership initiatives addressing disaster-related issues	☐		

Table C-13
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	Yes	2	-
<i>StormReady</i> Certification	No	-	-
<i>TsunamiReady</i> Certification	No	-	-
<i>Firewise Communities</i> Certification	No	-	-

Political Capability

Overall, political capability in the City is moderate. A good example of political capability in the City is the consolidation of the Police Department in 2018, which increased the size and capability of the Department and was supported by citizens and the Council. There is also consensus among the current City Council to move forward with a General Plan update.

C.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE**Table C-14****National Flood Insurance Program (NFIP) Compliance**

Designated Floodplain Administrator:	Sherman Low, City Engineer
NFIP Community Number:	060197
Flood Insurance Policies in Force:	19
Insurance Coverage in Force:	\$6,577,500
Written Premium in Force:	\$50,436
Total Loss Claims:	1
Total Payments for Losses:	\$750
Adopted Regulations that meet NFIP Requirements:	
•	Flood Damage Prevention Ordinance (Municipal Code 15.44)
Date of last NFIP Community Assistance Visit (CAV):	
	Unknown.
Higher standards that exceed minimum NFIP requirement:	
	None.
Additional floodplain management provisions:	
	None.
Floodplain management activities performed that go beyond FEMA minimum requirements:	
•	Annual creek maintenance program
•	Storm drain inspections and maintenance
•	Major projects to address property flooding including rebuilding an intersection and installing larger drains each to address property flooding
Existing impediments to running an effective NFIP program:	
	Lack of staff capacity.
Specific actions that are ongoing or considered related to continued compliance with the NFIP:	
	The City will continue to do the required actions to maintain NFIP compliance.

C.6.2 SELF-ASSESSMENT OF CAPABILITY

Table C-15
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	High
Fiscal Capability	Limited
Education and Outreach Capability	Moderate
Political Capability	Moderate
Overall Capability	Moderate

C.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

C.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new

possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.

- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.
- **Multi-Hazard/ Wildfire Evacuation Plan:** Information from the hazard mitigation plan is incorporated as appropriate.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

C.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Del Rey Oaks Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Del Rey Oaks are identified below:

- Primary hazard concerns include any event that threatens to shut down State Highway 218, the central spine and main transportation corridor providing ingress and egress to all areas within the City.
- Other identified critical community assets that must be protected from hazard risks include City Hall, the main pump station (located across the street from City Hall), the Public Works yard, and access to/from the school bus facility.
- The City is the law enforcement response agency for the Monterey Airport and in the event of an incident at the airport, the City would need to manage their resources carefully since they would likely be stretched thin.
- The City Hall/ Police Station Building is a critical facility that does not have a backup generator. The City would like to ensure this facility is self-sufficient in the event of a power outage.

C.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Del Rey Oaks Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table C-17* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table C-16* includes the status of actions completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table C-16
City of Del Rey Oaks Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
1	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary.	Completed/ Ongoing	This has been completed and will be continued on an as needed basis.
3	Develop an unreinforced masonry grant program that helps correct earthquake-risk nonmasonry building problems, including chimney bracing and anchoring water heaters.	Deleted	The City does not have the bandwidth to operate a residential program and there is little to no unreinforced masonry buildings in the City.
4	Examine and mitigate critical infrastructure that has been identified as currently being too narrow to ensure the safe transportation of truck loads within Monterey County.	Completed	The City examined this problem and determined this was a risk that did not need mitigation.

Table C-17
City of Del Rey Oaks Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing/ Continuous	All	Develop a sustained public outreach program that encourages consistent hazard mitigation content, including providing information online, in the newspaper, and in the annual City newsletter.	Priority / High	City Clerk	General Funds
2	Ongoing/ Continuous	Wildfire	Continue to conduct current fuel management programs and investigate and apply new and emerging fuel management techniques.	Priority / High	Public Works, Seaside Fire	General Funds and Grants
3	New/ Mid-term	All, Earthquake	Ensure the redundancy and resilience of municipal infrastructure, including installing a backup generator in the City Hall/ Police Station facility and planning for power outages.	Priority / High	City Manager, Police Department	General Funds and Grants
4	New/ Long-term	All, Flooding, Earthquake, Utility Interruption	Identify risks associated with aging water and sewer lines.	Priority / Moderate	Public Works, Seaside Sanitation	
5	Ongoing/ Continuous	Flooding	Continue annual creek maintenance program in order to reduce flood risk.	Priority / Moderate	Public Works	
6	New/ Mid-term	All	Begin the General Plan update and include relevant information on hazards in the Safety Element.	Priority / High	City Manager, Planning Department	
7	Ongoing/ Continuous	Wildfire, Hazardous Materials Incidents	Continue wildfire fuel risk abatement on the City's Fort Ord property and continue routine inspections of encampments in order to address fire and hazardous materials risks.	Priority / Moderate	Public Works, Police Department	

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ANNEX D: CITY OF GONZALES



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



D. CITY OF GONZALES

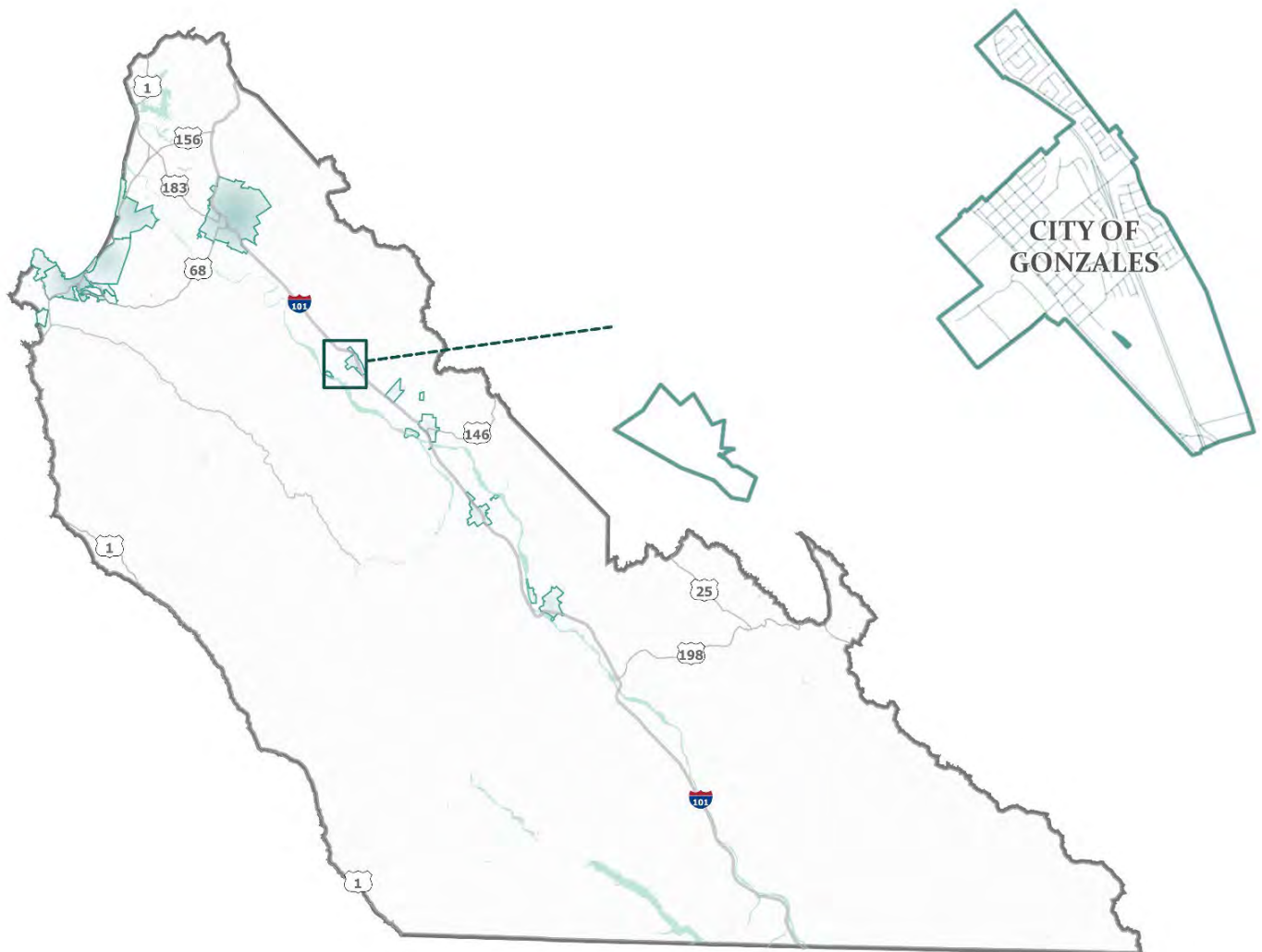
D.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Jason Muscio
Fire Chief/Fire Marshall
Gonzales Fire Department
147 4th Street
Gonzales, CA 93926
jmuscio@ci.gonzales.ca.us

D.2 COMMUNITY PROFILE

D.2.1 LOCATION



D.2.2 GEOGRAPHY AND CLIMATE

Gonzales is a small city of nearly 2 square miles surrounded by surrounded by prime agricultural land in the heart of the Salinas Valley. The City is located along Highway 101, 17 miles south of Salinas and nine miles north of Soledad. The city maintains a small-town character and rural atmosphere consistent with its agricultural heritage, and in so doing, has concentrated on improving its historic downtown while also conserving farmland on the city's perimeter.

D.2.3 HISTORY

The town of Gonzales was established in 1874 on land previously deeded from Mexico to Teodoro Gonzales, a member of the Mexican Army. He left his land to his sons, who developed the layout of the town. The earliest recorded population of Gonzales was in 1894, when an estimated 500 people resided in the town. The Southern Pacific Railroad had been in place almost two years when the town was established, tracks connected Soledad and Salinas had been laid through the area in 1872. Later, a depot was built in the City to service freight and passenger trains.

Cattle and grain raising dominated the area until the 1890s when Swiss immigrants founded dairies. At the turn of the century, the Alpine Condensary was established to produce condensed milk, a process originated by a local resident. In the 1920s, dairy farming gave way to row crops which thrived because of rich soils and advancements in irrigation, machinery, and transportation. The first schoolhouse was built in 1874. The Gonzales Baptist Church was built in 1884 and still holds worship services at the corner of Fourth and Day Streets. In January 1947, Gonzales residents voted to incorporate the City. The most significant change after incorporation was the relocation of Highway 101 in the 1960s.

D.2.4 POPULATION

The City of Gonzales has a population of 8,647 people (2020 Census), a 5.6% increase since 2010.

D.2.5 GOVERNING BODY FORMAT

The City of Gonzalez has a Council-Manager form of government. The five-member City Council is elected at large. The Mayor is elected every two years and Council Members are elected every four years.

D.2.6 ECONOMY AND TAX BASE

Gonzales is an established regional leader in agricultural-technology and innovation, environmental awareness, and sustainable practices. As an agriculturally based city, the City of Gonzales is well served with the types of businesses that supply services to the agricultural industry. Some of the City's most successful small-scale business operations are agricultural service related and include agricultural service and supply, agricultural equipment sales and service, farm supply and irrigation services, seedlings, warehousing, agricultural equipment servicing and repair. The farmlands surrounding the City of Gonzales contribute to its prominence as an agricultural business center. Head and leaf lettuce, broccoli, cauliflower, asparagus, and wine grapes are grown in the fields around the City. The City has several notable food processing/ manufacturing and fresh vegetable processing and cooling businesses. Many local businesses are directly involved in the Ag-Tech revolution as it is developing to face current challenges and those we will face in the near future.

Known as the “Wine Capital of Monterey County” and located at the base of the Santa Lucia Appellation, Gonzales is a short distance from many world class wineries, with more than 46 vineyard properties and approximately 5,900 acres in production. Gonzales also has an agricultural tourism industry, which enables those interested in knowing where and how their food is grown to have a first-hand experience. To further strengthen agriculture as a key part of its economic base, the City worked successfully to develop the Gonzales Agricultural Business Park, a 50-acre state-of-the-art facility on the west side of the community to enhance the industrial area and central business district.

D.3 PLANNING PROCESS

The City of Gonzales followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Gonzales held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on September 14, 2021. Key stakeholders present at the meeting included:

- Mark L. Hartunian, Deputy City Manager
- Keith Wise, Police Chief
- Patrick Dobbins, Public Works Director
- Matthew Sundt, Community Development Director
- Jason Muscio, Fire Chief

D.4 LAND USE AND DEVELOPMENT

The *Gonzales 2010 General Plan* is a long-range plan with an urban growth area containing approximately 2,150 acres of land for urbanization. The General Plan update focuses substantial future urban development to the east of Highway 101, thereby enabling preservation of the majority of the most productive agricultural soils near the City. The 2010 General Plan establishes a long-term vision to discourage incremental development that could result in an incoherent or sprawling development pattern, with major objectives that include creating a self-sustaining local economy, preserving the small town-character, discouraging suburban sprawl, protecting the best agricultural lands, building energy efficient projects, and providing residents abundant opportunities to enjoy open space and the natural environment.

Residential use in Gonzales represents approximately one-third of all land use, and of this amount about 80% is single-family residential housing. Industrial use represents almost 13% of land use. Streets and highways represent approximately 17%, and public/ semipublic use represents approximately 8%. Commercial use represents about 2% of land use. While there is some mixing of land uses, most of the residential, industrial, commercial, and public areas are clearly separated. Given the lack of physical constraints and the precedent of new housing and shopping areas east of Highway 101, Gonzales is a likely candidate for additional growth during the coming decades. The main areas of growth in the City are industrial, on the west end of the City, and residential and retail on the east end of the City.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The Gonzales Safe Growth Survey was completed by Matthew Sundt, Community Development Director for the City of Gonzales. The results are summarized in *Table D-1*.

Table D-1
City of Gonzales Safe Growth Survey Results

Topic Area	2021	2016
Land Use	4.00	5.00
Transportation	4.33	5.00
Environmental Management	5.00	4.67
Public Safety	4.33	4.33
Zoning Ordinance	3.00	3.00
Subdivision Regulations	3.00	5.00
Capital Improvement Program & Infrastructure Policies	3.67	4.67
Building Code	5.00	5.00
Economic Development	5.00	5.00
Average Survey Ratings	4.15	4.63

D.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Gonzales's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Gonzales is included in this Annex.

The City of Gonzales's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/

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catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**.

Table D-2 displays the results of the hazard risk ranking exercise that was performed by the City of Gonzales's Planning Team.

Table D-2
Threat Hazard Identification Risk Assessment (THIRA): City of Gonzales

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	2.6	2.4	2.6	2.6	10.2	Substantial
Coastal Erosion	-	-	-	-	-	-
Coastal Flooding	-	-	-	-	-	-
Cyber-Attack	2.3	2.0	2.6	3.0	9.9	Moderate
Dam Failure	1.4	1.4	2.0	2.0	6.8	Possible
Drought & Water Shortage	3.0	3.0	3.0	3.0	12.0	Substantial
Earthquake	2.6	2.6	3.0	3.0	11.2	Substantial
Epidemic	3.2	3.0	3.2	3.2	12.6	High
Extreme Cold & Freeze	1.8	1.8	1.6	1.6	6.8	Possible
Extreme Heat	2.2	2.2	2.4	2.4	9.2	Moderate
Flash Flood	1.8	1.6	1.8	1.8	7.0	Possible
Hazardous Materials Incident	2.2	2.0	2.6	2.4	9.2	Moderate
Invasive Species	1.4	1.4	1.4	1.6	5.8	Slight
Levee Failure	1.6	1.6	1.8	1.8	6.8	Possible
Localized Stormwater Flooding	2.4	2.2	2.4	2.4	9.4	Moderate
Mass Migration	1.3	1.3	1.5	1.5	5.5	Slight
Pandemic	2.8	2.6	2.6	3.0	11.0	Substantial
Riverine Flooding	1.8	1.6	1.8	1.8	7.0	Possible
Sea Level Rise	-	-	-	-	-	-
Severe Winter Storms	2.0	1.8	2.0	2.0	7.8	Possible
Slope Failure	1.6	1.6	1.8	1.8	6.8	Possible
Targeted Violence	1.2	1.4	1.6	1.6	5.8	Slight
Terrorism	1.2	1.2	1.4	1.6	5.4	Slight
Tsunami	-	-	-	-	-	-
Utility Interruption/ PSPS	2.4	2.6	2.6	2.6	10.2	Substantial
Water Contamination	1.6	1.6	2.0	2.0	7.2	Possible
Wildfire	1.8	1.8	1.6	1.6	6.8	Possible
Windstorms	1.4	1.4	1.4	1.4	5.6	Slight

D.5.1 AGRICULTURAL EMERGENCIES

The agricultural industry is a major economic driver in the City. Agricultural disasters pose a serious threat to the local economy and populations directly employed by the agriculture industry.

D.5.2 COASTAL EROSION

The City is not located on the coast, and therefore coastal erosion is not a major threat. Coastal erosion does threaten agricultural land in the Salinas Valley, which if impacted could have indirect economic effects on the local economy. The City could also be impacted by other types of erosion not profiled in this Plan.

D.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in the dam inundation zones of the Los Padres and Forest Lake dams. *Table D-3* summarizes population and property in the City exposed to spillway and dam failure of the Nacimiento and San Antonio dams.

Table D-3 Population and Property Exposed to Dam Failure Risk by Dam and Failure Type in Gonzalez					
Dam Failure Scenario	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Nacimiento Spillway Failure	0	0	\$0	8	\$818
Nacimiento Dam Failure	0	0	\$0	14	\$6,519,342
San Antonio Spillway Failure	0	0	\$0	0	\$0
San Antonio Dam Failure	0	0	\$0	18	\$7,384,413

Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact on the City.

D.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Drought also is often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most

significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

D.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 1,782 residential and non-residential buildings in the City, with a total value of \$630,088,033. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table D-4* summarizes population and property in the City exposed to liquefaction risk.

Table D-4
Population and Property Liquefaction Risk in Gonzalez

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	0	0	\$0	8	\$818
Moderate Liquefaction Susceptibility	4,296	388	\$102,456,287	349	\$178,050,637

D.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table D-5* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table D-5
Population and Property Exposed to Flooding Risk in Gonzalez

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	3,432	54	\$24,099,061	55	\$48,318,809
500-Year Flood Zone	0	0	\$0	0	\$0

D.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances

will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table D-6 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table D-6					
Population and Property Exposed to Hazardous Materials Incident Risk in Gonzalez					
Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	6,758	1,303	\$437,053,854	471	\$193,033,361
Fixed Source	5,896	1,002	\$307,965,433	443	\$193,033,361

D.5.8 HUMAN-CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

D.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

D.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip

code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts. FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table D-7*.

Table D-7
Annualized Frequency and Exposure to Severe Weather Events in Gonzales

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.34	Frequency (<i>Distinct Events</i>)	0.09
Exposed Population	5,029	Exposed Population	5,029
Exposed Building Values	\$324,436,000	Exposed Building Values	\$324,436,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$446
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	0.82	Frequency (<i>Distinct Events</i>)	1.28
Exposed Population	5,029	Exposed Population	79
Exposed Building Values	\$324,436,000	Exposed Building Values	\$5,109,534
Expected Annual Loss of Building Value	\$1	Expected Annual Loss of Building Value	\$130,631
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.40	Frequency (<i>Event-Days</i>)	0.06
Exposed Population	5,029	Exposed Population	82
Exposed Building Values	\$324,436,000	Exposed Building Values	\$7,862,000
Expected Annual Loss of Building Value	\$54	Expected Annual Loss of Building Value	\$15

Source: FEMA National Risk Index

D.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 180 people and \$16,644,258 in building value in the City is exposed to landslide risk. Additionally, the City is not susceptible earthquake induced to landslides.

D.5.12 TSUNAMI

The City is not located in a mapped tsunami inundation zone.

D.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption.

D.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table D-8 summarizes population and property in the City in very high, high, and moderate fire threat areas.

Table D-8
Population and Property Exposed to Wildfire Risk in Gonzalez

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	1,033	0	\$0	4	\$1,318,537
Moderate Fire Threat	3,554	107	\$50,153,625	75	\$135,295,821.00

D.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures will have direct impacts on public health and infrastructure. Drought, flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the local economy, along with changes to agriculture and crops, which are a critical backbone of the City's economy.

D.6 CAPABILITY ASSESSMENT

The City of Gonzales performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table D-9*
- An assessment of administrative and technical capabilities is presented in *Table D-10*
- An assessment of fiscal capabilities is presented in *Table D-11*
- An assessment of education and outreach capabilities is presented in *Table D-12*
- Classifications under various community mitigation programs are presented in *Table D-13*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section D.6.1 in *Table D-14*
- An overall self-assessment of capability is presented in Section D.6.2 in *Table D-15*

Table D-9
Planning and Regulatory Capability

Document		Department	Comments
Planning Documents			
General Plan	☒	• Community Development	
Capital Improvement Plan	☒	• Public Works	
Floodplain Management Plan	☒	• Public Works	
Open Space Management Plan	☒	• Public Works	
Stormwater Management Plan	☒	• Public Works	
Coastal Management Plan	☐		
Local Coastal Program	☐		
Climate Action/ Adaptation Plan	☒	• Community Development	
Emergency Operations Plan	☒	• Fire Department	Under review for re-adoption by City Council
Continuity of Operations Plan	☒	• City Manager	
Community Wildfire Protection Plan	☐		
Evacuation Plan	☒	• Fire Department • Police Department	Under review
Disaster Recovery Plan	☒	• All Departments	
Economic Development Plan	☒	• Community Development	
Historic Preservation Plan	☒	• Community Development	
Transportation Plan	☒	• Community Development	
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	• Public Works	
Zoning Ordinance	☒	• Community Development	
Subdivision Ordinance	☒	• Community Development	
Site Plan Review Requirements	☒	• Community Development	
Unified Development Ordinance	☐		
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐		
Building Code	☒	• Community Development	
Fire Prevention Code	☒	• Fire Department	

Table D-10
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒ • Community Development	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒ • Community Development • Public Works	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒ • Community Development • Public Works	
Building Inspector	☒ • Community Development	
Emergency Manager	☒ • City Manager	
Floodplain Manager	☒ • Public Works	
Land Surveyors	☒ • Public Works	
Resource development staff or grant writers	☒ • Contractual Services • All Departments	
Public Information Officer	☒ • City Manager	
Scientist(s) familiar with the hazards of the community	☐	
Staff with education or expertise to assess the community's vulnerability to hazards	☒ • Fire Department	
Personnel skilled in Geographic Information Systems (GIS)	☒ • Public Works	
Maintenance programs to reduce risk	☒ • Public Works	
Warning systems/services	☒ • Fire Department	
Mutual Aid Agreements	☒ • Police Department • Fire Department • Public Works	

Table D-11
Fiscal Capability

Fiscal Resources	Department	Comments
General Funds	☒ • Finance	
Capital Improvements Project Funding	☒ • Finance	
Special Purpose Taxes	☒ • Finance	
Stormwater Utility Fees	☐	

Table D-11
Fiscal Capability

Fiscal Resources	Department	Comments
Gas / Electric Utility Fees	☐	
Water / Sewer Fees	☒ • Finance	
Development Impact Fees	☒ • Finance	
General Obligation Bonds	☒ • Finance	
Special Tax and Revenue Bonds	☒ • Finance	

Table D-12
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☐	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒ • Fire Department • Public Works	
Natural disaster or safety related school programs	☒ • Fire Department	
Public-private partnership initiatives addressing disaster-related issues	☒ • City Manager	

Table D-13
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	Yes	3/3X	
<i>StormReady</i> Certification	No	-	-
<i>TsunamiReady</i> Certification	No	-	-
<i>Firewise Communities</i> Certification	No	-	-

D.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table D-14
National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Patrick Dobbins, City Engineer
NFIP Community Number:	060198
Flood Insurance Policies in Force:	14

Table D-14
National Flood Insurance Program (NFIP) Compliance

Insurance Coverage in Force:	\$5,474,500
Written Premium in Force:	\$18,502
Total Loss Claims:	10
Total Payments for Losses:	\$187,853
Adopted Regulations that meet NFIP Requirements:	
Gonzales City Code CHAPTER 14.04 FLOODPLAIN MANAGEMENT	
Date of last NFIP Community Assistance Visit (CAV):	
Unknown	
Higher standards that exceed minimum NFIP requirement:	
None identified.	
Additional floodplain management provisions:	
None identified.	
Floodplain management activities performed that go beyond FEMA minimum requirements:	
None identified.	
Existing impediments to running an effective NFIP program:	
None identified.	
Specific actions that are ongoing or considered related to continued compliance with the NFIP:	
The City will continue to comply with NFIP requirements.	

D.6.2 SELF-ASSESSMENT OF CAPABILITY

Table D-15
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Moderate
Fiscal Capability	Moderate
Education and Outreach Capability	Moderate
Political Capability	Moderate
Overall Capability	Moderate

D.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

D.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.
- **Climate Action Plan:** Highlights potential programs that could be implemented to reduce greenhouse gas emissions and discusses possible impacts of climate change.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans

- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans

D.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Gonzales Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Gonzales are identified below:

- The Fifth Street Overpass is a vital infrastructure asset for the city to protect from any damage or disruption caused by hazards, as it not only serves as critical transportation artery but is also used for all sewer and water lines that provide service for the city.
- The City's wastewater treatment facility is vulnerable to flooding along the Salinas River. It is currently located in a special flood hazard area and protected by two uncertified earthen levees, with privately-owned farmland in between. These levees, which have been overtopped in past flood events, should be bolstered to increase protection against future flood damages and service disruptions.
- Three schools are designated as community shelters (La Gloria Elementary, Fairview Middle, and Gonzales High) but currently the portable classrooms are deemed more structurally safe to seismic events.
- Past flood losses/claims have all occurred along the slough (and within the mapped special flood hazard area) on west side of city between First and Fifth Streets.
- Agricultural facilities are known to store extremely hazardous substances for production, such as ammonia, so hazardous materials events remain a primary concern for the City. Additionally, hazardous materials travel along Highway 101 and pose a hazardous materials threat.
- Highway 101 is the only lifeline/ingress egress route in the event of a major evacuation. A closure of the freeway would severely limit movement in the event of an evacuation.

- Utility interruption and Public Safety Power Shutoffs (PSPS) can significantly impact industrial uses in the City. Past PSPS events have resulted in millions of dollars of losses to the agricultural industry. Additionally, utility interruption and PSPS events can significantly impact telecommunications and cellular operations in the City, as the main cellular provider has no back-up generator.
- Drought is a major concern for the City. Long-term drought conditions could devastate the local economy.

D.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Gonzales Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table D-17* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table D-16* includes the status of action previous plan completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table D-16
City of Gonzales Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
1	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary.	Completed	Completed and ongoing as the City's grows.
2	Develop an unreinforced masonry grant program that helps correct earthquake-risk nonmasonry building problems, including	Completed	The City received grants to seismically retrofit the fire house. Additionally, the Fire Department inspects water heaters to ensure they are anchored.

Table D-16
City of Gonzales Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
	chimney bracing and anchoring water heaters.		
4	Identify and carry-out minor flood and stormwater management projects that would reduce damage to infrastructure and damage due to local flooding/inadequate drainage.	Continuous	This action is included in the 2021 Action Plan, but it is of note that the City completed a variety of storm drain upgrades over the previous planning cycle, including a new lift station and installation of additional bioswales.
7	Implement adopted climate action plan.	Completed	The City completed and implemented, Climate Action Plans in 2013 and 2018.
11	Improve disaster response training between all responders.	Completed/ Ongoing	The City completed two emergency drills across all departments. City Council and Management staff have all completed NIMS/ICS training. The City also conducts a drill annually on the anniversary of the Loma Prieta Earthquake and will continue to ensure that at least one major emergency drill is completed every year.
13	Develop public-private partnerships with local businesses to increase business and government resilience.	Completed/ Ongoing	This is included in the 2021 Action Plan because of its strategic importance, but it should be noted that the City created a new position, Director of Strategic Partnerships. During Covid-19 the City worked in conjunction with local business on a variety of initiatives and has built very strong partnerships with the business community.

Table D-17
City of Gonzales Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Continuous / Ongoing	Flooding	Explore mitigation opportunities for repetitively flooded properties, and if necessary, carry-out acquisition, relocation, elevation, and flood-proofing measures to protect these properties.	Priority / High	Public Works Department	Federal and State Grants (e.g., FMA grants)
2	Continuous / Ongoing	Flooding	Identify and carry-out minor flood and stormwater management projects that would reduce damage to infrastructure and damage due to local flooding/ inadequate drainage.	Priority / High	Public Works Department	Federal and State Grants (e.g., PDM grants)
3	Continuous / Ongoing	All	Examine and mitigate critical infrastructure that has been identified as currently being too narrow to ensure the safe transportation of truckloads within Monterey County.	Priority / High	Planning Department	Federal and State Grants (e.g., PDM grants)
4	Continuous / Ongoing	All	Promote Disaster Resilient Community, including the creation of a Community Emergency Response Team (CERT) and continued public education for disaster resilience.	Priority / High	Office of Emergency Services	Local General Fund, PG&E Grants
5	Continuous / Ongoing	All	Monitor all existing critical facilities for susceptibility to impacts from natural and manmade disasters.	Priority / Low	Building Department	Local General Fund
6	Continuous / Ongoing	Flooding	Improve floodway management.	Priority / High	Public Works Department	Various Grants
7	In Progress	All	Improve Emergency Operations Center capability.	Priority / Moderate	Office of Emergency Services	Unknown, Grants Needed
8	Continuous / Ongoing	All	Develop and continue to build on existing public-private partnerships with local businesses to increase business and government resilience.	Priority / High	Community Engagement and Strategic Partnerships	Local General Fund

Table D-17

City of Gonzales Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
9	In Progress	Flooding	Increase flood resilience of wastewater treatment facility.	Priority / Moderate	Public Works Department	Mitigation Grants Matched by Local Funds
10	In Progress	Drought	Develop redundant systems for water system resilience, including development of new wells.	Priority / Moderate	Public Works Department	Mitigation Grants Matched by Local Funds
11	In Progress	Climate Change	Continue work on Community Microgrid Project in order to increase energy independence and community resiliency.	Priority / High	Public Works Department	General Fund, Grants
12	New	All	Expand the wastewater treatment system.	Priority / Moderate	Public Works Department	General Fund, Grants
13	In Progress	All	Implement Enhanced Infrastructure Finance District (EIFD) for the new Agricultural Business Park.	Priority / Moderate	City Manager	General Fund
14	New	All	Build new Police Substation and Fire Station on the other side of Highway 101 in order to provide public safety services and support new residential development.	Priority / Moderate	Community Development Department	General Fund, Grants

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ANNEX E: CITY OF GREENFIELD



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



E. CITY OF GREENFIELD

E.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

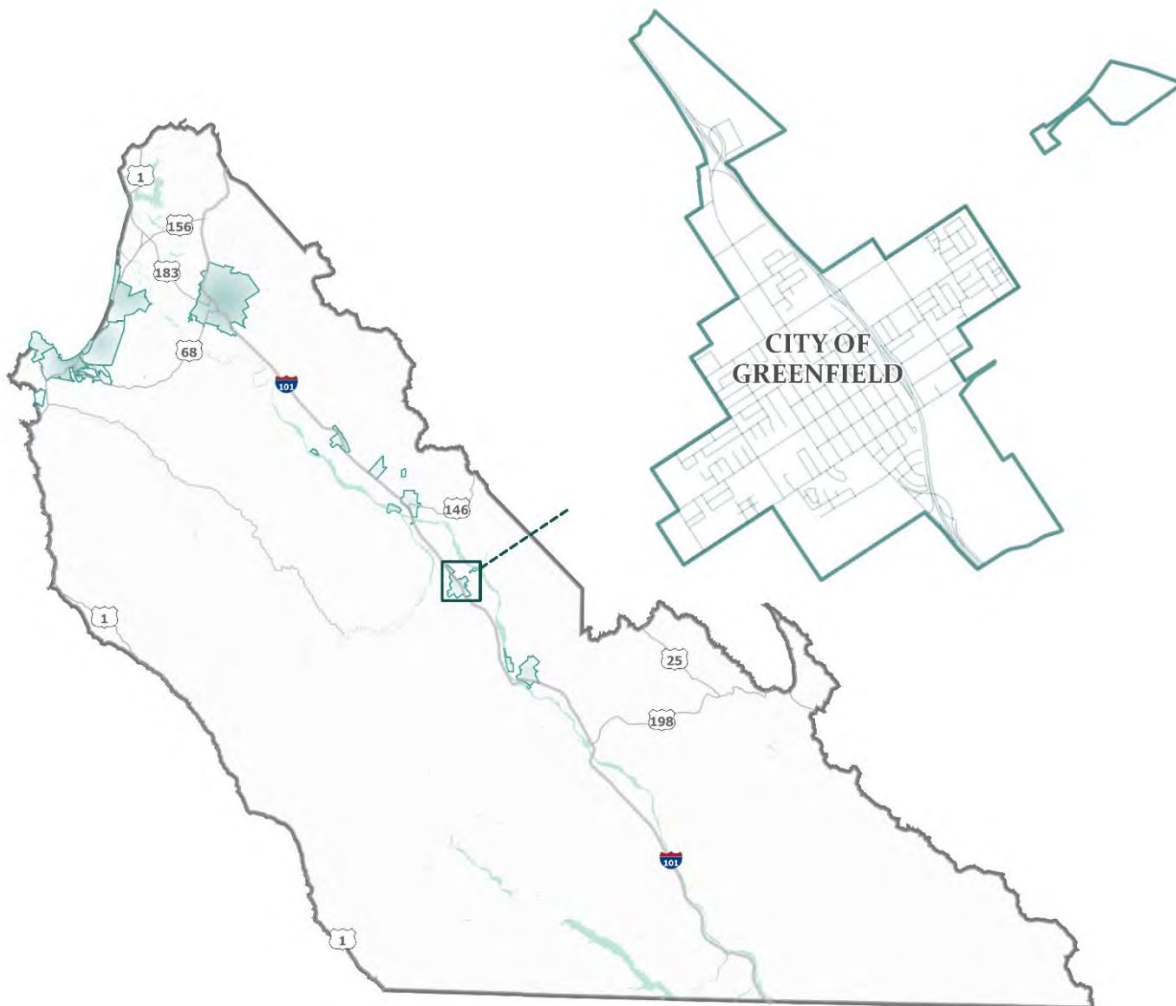
Chief Jim Langborg
Fire Chief
Greenfield Fire
380 Oak Avenue
Greenfield, CA 93927
(831) 674-5484
jlangborg@ci.greenfield.ca.us

Alternate Point of Contact

Paul Wood
City Manger
City of Greenfield
599 El Camino Real
PO Box 127
Greenfield, CA 93927
831-674-5591

E.2 COMMUNITY PROFILE

E.2.1 LOCATION



E.2.2 GEOGRAPHY AND CLIMATE

The City of Greenfield is located in the heart of the Salinas Valley, formed by the Gabilan Mountains range to the east and the Santa Lucia Mountains range to the west. The City of Greenfield covers slightly more than 2 square miles along US Highway 101. Salinas, the county seat, is located 35 miles to the north. Soledad and Gonzales are located 8 and 17 miles north, respectively. King City is located 11 miles to the south. The climate for Greenfield is moderate with average temperatures around 40 degrees in winter and about 80 degrees in summer.

E.2.3 HISTORY

The City of Greenfield, began as Clark Colony in April of 1905, created by a subdivision of 4,000 acres of valley bottomland by the California Home Extension Association, a branch of Rancho Arroyo Seco. A public drawing was held at their branch office in Los Angeles on April 5, 1905. The average price per acre was \$37.50, including water rights.

The organization of the water distribution system, the Clark Colony Water Company, was formed on April 7, 1905. The organization would be in charge of distributing water to the stockholders who paid the debt at the rate of \$25 for each of the subdivision's acres. With a water canal system and good growing conditions, people of Danish, Swiss and other nationalities from surrounding areas settled in Greenfield. The Clark Colony settlers then constructed the largest irrigation and domestic water supply system in the Salinas Valley. Today, the Clark Colony Water Company still holds 1916 Prior Rights guaranteeing delivery to its members a certain amount of water from the Arroyo Seco River before any other agencies' use of the river water.

On April 6, 1906, the district purchased a lot from Edward Greenfield for \$33.75 along with two adjacent to the Arroyo Seco Development Company for \$145.80. By 1906, local carpenters including R.D. Hall, Alfred Hansen and Al Leoni had completed a new school building on the property, located at El Camino Real and Walnut Avenue consisting of two classrooms with a library between them. Romie School District officially became Greenfield School District on July 1, 1909.

Clark Colony evolved into Clark City and was eventually renamed Greenfield, after the United States Postal Service informed the City that there were too many "Clark Cities" in the state. The name was picked to honor a long-time settler of the area, Mr. Greenfield, who was instrumental in the formation of the City and was active in public affairs of the City. Greenfield was recognized as a municipality by the State of California legislature and incorporated on January 7, 1947.

E.2.4 POPULATION

The City of Greenfield has a population of 18,937 people, an increase of 16% since 2010. Greenfield is among Monterey County's fastest growing cities, also experiencing an increase in population of nearly 30% between 2000 and 2010. The Association of Monterey Bay Area Governments projects that the population will grow to 24,912 by 2025 and 30,337 by 2035.

E.2.5 GOVERNING BODY FORMAT

The City of Greenfield is run by a City Manager form of government, with a five-member City Council. The City Council is composed of a Mayor and four Council Members who are elected at large for four-year terms.

E.2.6 ECONOMY AND TAX BASE

The City of Greenfield is a densely populated city that has a small-town charm that mixes rural and suburban lifestyles with ongoing agricultural activities, and comparatively affordable housing prices that has fueled a growing population of professional and skilled workers.

The City of Greenfield is located in one of the most productive agricultural areas in the world, the Salinas Valley. The area around Greenfield is also the heart of Monterey County's premier wine grape growing region due to favorable soils and climate with over twenty vineyards and wineries within a thirty-mile radius. Local tourism is increasing as more people are attracted to the area.

E.3 PLANNING PROCESS

The City of Greenfield followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Greenfield held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on September 23, 2021. Key stakeholders present at the meeting included:

- Jim Langborg, Fire Chief
- Captain Carlos Vega, Administrative Fire Captain
- Paul Mugan, Planning Director
- Manuel Ayala, Public Works Division Manager

E.4 LAND USE AND DEVELOPMENT

Greenfield adopted its General Plan in 2005. Between 1985 and 1990 Greenfield's growth kept pace with neighboring Salinas Valley cities, and this trend has generally continued in the period between 2000 and 2005. The growth of agriculture and related business and industries in the Greenfield area has contributed to the city's significant growth since 1970. The City of Greenfield currently contains over 1,000 acres of land within the City limits. Most of this area is currently built out or committed to urban land uses. Approximately 270 acres are undeveloped in the City limits. The largest land use is residential, which represents about 47% of the acreage in the City. Commercial and light industrial uses each constituted approximately 3%. Other uses were Public and Quasi-Public uses (19%), Agriculture (15%), mixed-use (3%) and Recreation & Open Space (less than 1%). 10% of the City's land was categorized as vacant.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The Greenfield Safe Growth Survey was completed by Chief Jim Langborg, Fire Chief for the City of Greenfield Fire Department in collaboration with other key members of City Staff. The results are summarized in *Table E-1*.

Table E-1
City of Greenfield Safe Growth Survey Results

Topic Area	2021	2016
Land Use	3.75	3.50
Transportation	2.67	3.33
Environmental Management	4.00	3.33
Public Safety	3.00	3.33
Zoning Ordinance	3.00	3.00
Subdivision Regulations	3.00	3.00
Capital Improvement Program & Infrastructure Policies	3.00	3.00
Building Code	4.00	4.00
Economic Development	3.00	4.00
Average Survey Ratings	3.27	3.39

E.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Greenfield's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Greenfield is included in this Annex.

The City of Greenfield's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table E-2* displays the results of the hazard risk ranking exercise that was performed by the City of Greenfield's Planning Team.

Table E-2
Threat Hazard Identification Risk Assessment (THIRA): City of Greenfield

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	3.0	4.0	3.0	3.0	13.0	High
Coastal Erosion	-	-	-	-	-	-
Coastal Flooding	-	-	-	-	-	-
Cyber-Attack	2.0	2.0	3.0	3.0	10.0	Moderate
Dam Failure	2.0	1.0	2.0	2.0	7.0	Possible
Drought & Water Shortage	2.0	2.0	2.0	2.0	8.0	Possible
Earthquake	3.0	2.0	3.0	3.0	11.0	Substantial
Epidemic	3.0	3.0	3.0	3.0	12.0	Substantial
Extreme Cold & Freeze	3.0	2.0	3.0	3.0	11.0	Substantial
Extreme Heat	3.0	3.0	2.0	2.0	10.0	Moderate
Flash Flood	2.0	2.0	2.0	3.0	9.0	Moderate
Hazardous Materials Incident	2.0	2.0	3.0	3.0	10.0	Moderate
Invasive Species	2.0	2.0	2.0	2.0	8.0	Possible
Levee Failure	-	-	-	-	-	-
Localized Stormwater Flooding	2.0	3.0	2.0	2.0	9.0	Moderate
Mass Migration	3.0	2.0	3.0	3.0	11.0	Substantial
Pandemic	3.0	3.0	3.0	3.0	12.0	Substantial
Riverine Flooding	2.0	3.0	2.0	3.0	10.0	Moderate
Sea Level Rise	-	-	-	-	-	-
Severe Winter Storms	3.0	2.0	3.0	3.0	11.0	Substantial
Slope Failure	1.0	1.0	1.0	1.0	4.0	Negligible
Targeted Violence	2.0	2.0	3.0	3.0	10.0	Moderate
Terrorism	2.0	1.0	3.0	3.0	9.0	Moderate
Tsunami	-	-	-	-	-	-
Utility Interruption/ PSPS	3.0	2.0	3.0	3.0	11.0	Substantial
Water Contamination	3.0	2.0	3.0	3.0	11.0	Substantial
Wildfire	3.0	3.0	3.0	3.0	12.0	Substantial
Windstorms	3.0	2.0	3.0	3.0	11.0	Substantial

E.5.1 AGRICULTURAL EMERGENCIES

The agricultural industry is a major economic driver in the City. Agricultural disasters pose a serious threat to the local economy and populations directly employed by the agriculture industry.

E.5.2 COASTAL EROSION

The City is not located on the coast, and therefore coastal erosion is not a major threat. Coastal erosion does threaten agricultural land in the Salinas Valley, which if impacted could have indirect economic

effects on the local economy. The City could also be impacted by other types of erosion not profiled in this Plan.

E.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in the dam inundation zones of the Los Padres and Forest Lake dams. *Table E-3* summarizes population and property in the City exposed to spillway and dam failure of the Nacimiento and San Antonio dams.

Table E-3 Population and Property Exposed to Dam Failure Risk by Dam and Failure Type in Greenfield					
Dam Failure Scenario	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Nacimiento Spillway Failure	0	0	\$0	3	\$3,950
Nacimiento Dam Failure	0	0	\$0	3	\$4,423,463
San Antonio Spillway Failure	0	0	\$0	2	\$3,935
San Antonio Dam Failure	0	0	\$0	4	\$235,401

Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

E.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

E.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that

suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 3,159 residential and non-residential buildings in the City, with a total value of \$925,392,759. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table E-4* summarizes population and property in the City exposed to liquefaction risk.

Table E-4
Population and Property Exposed to Liquefaction Risk in Greenfield

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	0	0	\$0	3	\$3,950
Moderate Liquefaction Susceptibility	0	0	\$0	2	\$4,887,460

E.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table E-5* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table E-5
Population and Property Exposed to Flooding Risk in Greenfield

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	0	0	\$0	3	\$3,950
500-Year Flood Zone	0	0	\$0	0	\$0

E.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure.

For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table E-6 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table E-6
Population and Property Exposed to Hazardous Materials Incident Risk in Greenfield

Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	13,026	2,244	\$655,971,950	561	\$176,072,277
Fixed Source	8,969	1,314	\$346,157,777	349	\$66,305,431

E.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

E.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

E.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage.

All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts.

FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in Table E-7.

Table E-7
Annualized Frequency and Exposure to Severe Weather Events in Greenfield

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.38	Frequency (<i>Distinct Events</i>)	0.13
Exposed Population	14,041	Exposed Population	14,041
Exposed Building Values	\$821,527,000	Exposed Building Values	\$821,527,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$152
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	1.24	Frequency (<i>Distinct Events</i>)	1.28
Exposed Population	14,041	Exposed Population	10,792
Exposed Building Values	\$821,527,000	Exposed Building Values	\$646,495,439
Expected Annual Loss of Building Value	\$5	Expected Annual Loss of Building Value	\$16,528,440
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.30	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	14,041	Exposed Population	0
Exposed Building Values	\$821,527,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$96	Expected Annual Loss of Building Value	\$0
Source: FEMA National Risk Index			

E.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 0 people and \$0 in building value in the City is exposed to landslide risk. Additionally, the City is not susceptible earthquake induced to landslides.

E.5.12 TSUNAMI

The City is not located in a mapped tsunami inundation zone.

E.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption.

E.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table E-8 summarizes population and property in the City in very high, high, and moderate fire threat areas.

Table E-8
Population and Property Exposed to Wildfire Risk in Greenfield

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	0	0	\$0	0	\$0
Moderate Fire Threat	5,024	149	\$53,031,867	113	\$39,928,531

E.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures will have direct impacts on public health and infrastructure. Drought, flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the local economy, along with changes to agriculture and crops, which are a critical backbone of the City's economy.

E.6 CAPABILITY ASSESSMENT

The City of Greenfield performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table E-9*
- An assessment of administrative and technical capabilities is presented in *Table E-10*
- An assessment of fiscal capabilities is presented in *Table E-11*
- An assessment of education and outreach capabilities is presented in *Table E-12*
- Classifications under various community mitigation programs are presented in *Table E-13*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section E.6.1 in *Table E-14*
- An overall self-assessment of capability is presented in Section E.6.2 in *Table E-15*

Table E-9
Planning and Regulatory Capability

Document		Department	Comments
Planning Documents			
General Plan	☒	• Community Services	
Capital Improvement Plan	☒	• Fire Department	The FD has one but it's the only department that has one at this time.
Floodplain Management Plan	☐		
Open Space Management Plan	☐		

Table E-9
Planning and Regulatory Capability

Document		Department	Comments
Stormwater Management Plan	☐		
Coastal Management Plan	☐		N/A
Local Coastal Program	☐		N/A
Climate Action/ Adaptation Plan	☐		
Emergency Operations Plan	☒	• Fire Department • Police Department	A major update has been started but not worked on for a while.
Continuity of Operations Plan	☐		
Community Wildfire Protection Plan	☐		
Evacuation Plan	☒	• Fire Department • Police Department • Monterey County	Working with the County on this now.
Disaster Recovery Plan	☐		
Economic Development Plan	☐		
Historic Preservation Plan	☐		
Transportation Plan	☐		
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒		Chapter 8.48 FLOODPLAIN MANAGEMENT
Zoning Ordinance	☒	• Community Services	
Subdivision Ordinance	☒	• Community Services	
Site Plan Review Requirements	☒	• Community Services	
Unified Development Ordinance	☐		
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐		
Building Code	☒	• Community Services	
Fire Prevention Code	☒	• Fire Department	
Other Hazard-Specific Ordinances			

Table E-10
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	• Community Services	
Engineer(s) or professional(s) trained in construction practices	☒	• Public Works	

Table E-10
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
related to buildings and/or infrastructure			
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☐		
Building Inspector	☒	• Community Services	
Emergency Manager	☐		
Floodplain Manager	☐		
Land Surveyors	☐		
Resource development staff or grant writers	☐		
Public Information Officer	☐		
Scientist(s) familiar with the hazards of the community	☐		
Staff with education or expertise to assess the community's vulnerability to hazards	☐		
Personnel skilled in Geographic Information Systems (GIS)	☐		
Maintenance programs to reduce risk	☒	• Public Works	
Warning systems/services	☐		
Mutual Aid Agreements	☐		

Table E-11
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	• Finance	
Capital Improvements Project Funding	☒	• Finance	
Special Purpose Taxes	☒	• Finance	
Stormwater Utility Fees	☐		
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☐		
Development Impact Fees	☒	• Finance	
General Obligation Bonds	☒	• Finance	
Special Tax and Revenue Bonds	☒	• Finance	

Table E-12
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☐	The Greenfield Community Science Workshop is a community-based organization committed to enriching the educational experience of historically underserved youth by providing them with a safe, fun, and stimulating environment where they can explore their world through science.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒	
Natural disaster or safety related school programs	☒	
Public-private partnership initiatives addressing disaster-related issues	☐	

Table E-13
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	Yes	5	-
<i>StormReady</i> Certification	No		
<i>TsunamiReady</i> Certification	N/A	-	-
<i>Firewise Communities</i> Certification	No	-	-

E.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table E-14
National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	None identified.
NFIP Community Number:	060446
Flood Insurance Policies in Force:	3
Insurance Coverage in Force:	\$1,050,000
Written Premium in Force:	\$1,260
Total Loss Claims:	1
Total Payments for Losses:	\$0

Table E-14
National Flood Insurance Program (NFIP) Compliance

Adopted Regulations that meet NFIP Requirements:

- Chapter 8.48 FLOODPLAIN MANAGEMENT

Date of last NFIP Community Assistance Visit (CAV):

Unknown.

Higher standards that exceed minimum NFIP requirement:

None.

Additional floodplain management provisions:

None.

Floodplain management activities performed that go beyond FEMA minimum requirements:

None.

Existing impediments to running an effective NFIP program:

None identified.

Specific actions that are ongoing or considered related to continued compliance with the NFIP:

The City will continue to do the required actions to maintain NFIP compliance.

E.6.2 SELF-ASSESSMENT OF CAPABILITY

Table E-15
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Limited
Fiscal Capability	Limited
Education and Outreach Capability	Moderate
Political Capability	Moderate
Overall Capability	Moderate

E.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

E.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes

- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

E.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Greenfield Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Greenfield are identified below:

- The City's wastewater treatment operation is vulnerable to flooding along the Salinas River. While protected by an earthen levee, the effluent ponds are located in the special flood hazard area and should be better protected to withstand future flood and earthquake events to prevent damages, service disruption, and environmental contamination. There is also currently no on-site generator for backup power at the treatment facility.
- Isolation caused by Highway 101 bridge closures/failures is a major concern for the City (losing bridge access at Soledad to the north and King City to the south). This nearly occurred as a result of the major flood event in 1995.
- The City experiences frequent nuisance flooding at the intersection of Apple Avenue and El Camino Real due to inadequately sized stormwater drainage systems.
- Five URM structures remain in the City, all of which are privately-owned and have been posted with warning placards.
- The generator at City Hall is currently capable of only providing backup power to the Police Department, preventing the use of approximately half the building during power outage. This is identified as a threat to sustaining post-disaster recovery operations following major events.
- The City's Council Chambers has been designated by default as the Emergency Operations Center, but a dedicated and fortified structure is needed for the City to be better prepared in dealing with future hazard events.

- The City is concerned with hazardous associated with agricultural facilities and the chemicals used in their processes.
- The fire station has no emergency backup generator. This has caused delays in response, problems with communication and dispatch systems, day to day operations, and station security.

E.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Greenfield Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table E-17* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table E-16* includes the status of action previous plan completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table E-16
City of Greenfield Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
3	Develop an unreinforced masonry grant program that helps correct earthquake-risk nonmasonry building problems, including chimney bracing and anchoring water heaters.	Deleted	There are limited unreinforced masonry buildings left in the City and there is not currently capacity to run a grant program. An action to inform the public about the risk of unreinforced masonry was added to the updated action plan.
4	Examine and mitigate critical infrastructure that has been identified as currently being too narrow to ensure the safe transportation of truck loads within Monterey County.	Deleted	This is not in the City's jurisdiction, but they would support this effort.

Table E-16
City of Greenfield Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
7	Develop windstorm building requirements (e.g., fasteners for roof sheathing and singles) in high wind hazard areas.	Completed	The City has adopted all California Standard building codes.

Table E-17
City of Greenfield Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing/ Continuous	All	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary.	Priority / High	Planning	HMGP and PDM Grants
2	Ongoing	All, Severe Weather	Develop a sustained public outreach program that encourages consistent hazard mitigation content. Include content on the risks associated with winter storms, extreme heat, and extreme cold events.	Priority / High	Various	General Funds, HMGP, and PDM Grants
3	Ongoing	Wildfire	Continue to conduct current fuel management programs and investigate and apply new and emerging fuel management techniques.	Priority / High	Fire Department	General Funds and PDM Grant
4	Ongoing	Wildfire	Develop and provide funding and/or incentives for defensible space measures (e.g., free chipping day, free collection day for tree limbs).	Priority / High	Fire Department	General Funds, HMGP, and PDM Grants, State Fire Marshal
5	Ongoing	Windstorm, Severe Weather	Include provisions for dust erosion control methods in building, grading, and land clearing permits.	Priority / High	Planning	General Funds
6	Ongoing	Earthquake	Inform the public about the risks associated with unreinforced masonry and earthquake preparedness.	Priority / Moderate	Various	General Funds, HMGP, and PDM Grants
7	Ongoing	All	Find ways to provide critical infrastructure and emergency facilities with backup generators.	Priority / High	Various	General Funds, Grants

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ANNEX F: CITY OF KING



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



F. CITY OF KING

F.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

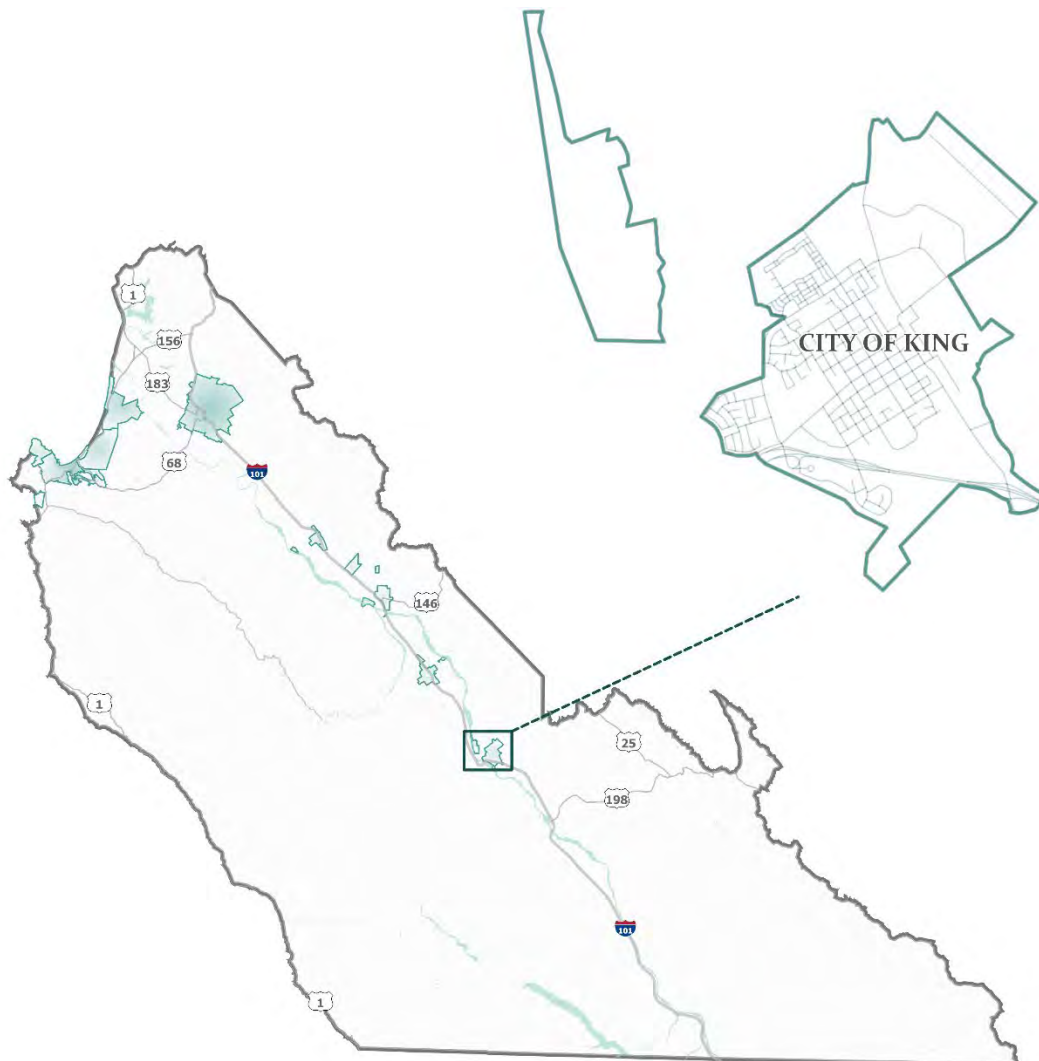
Steve Adams
City Manager
212 South Vanderhurst Avenue
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(831) 386-5917
sadams@kingcity.com

Alternate Point of Contact

Geoff English
Public Works Special Projects Coordinator
212 South Vanderhurst Avenue
King City, CA 93930
805-610-0191
genglish@kingcity.com

F.2 COMMUNITY PROFILE

F.2.1 LOCATION



F.2.2 GEOGRAPHY AND CLIMATE

King City is the southernmost city in Monterey County, located along the Salinas River and US Highway 101, and just south of Greenfield in the heart of the Salinas Valley. King City is 3.8 square miles and located in the center of one of the most productive agricultural valleys in the world. The City is also the primary access portal to the Pinnacles National Park, located a short drive to the east of the City. The Climate is semi-arid, although bordering on a Mediterranean climate, with very warm, mostly dry summers and cool, wet winters.

F.2.3 HISTORY

The location of King City on the banks of the Salinas River was a part of the vast San Lorenzo Rancho, a huge Spanish land grant that at one time extended from the Salinas River to the San Benito River, from the San Lorenzo on the south to San Juan on the north. Original grantees were Feliciano Soberanes, who received five leagues in 1841, and Francisco Rico, who was granted five leagues in 1842. When Charles King, King City founder, first saw the Salinas Valley it was a dry, windswept expanse of sand. The Salinas River ran bank to bank in wet years, a raging torrent in the winter. But in the summer the river went underground, leaving only a skeletal course of rock and sand the length of the Valley.

In 1884, King purchased 13,000 acres of the San Lorenzo grant in order to grow wheat. He set up ranch headquarters at what is now the Spreckels ranch north of the city. His first project was to plant 6,000 acres of wheat. King's neighbors told him that wheat would never grow and the only transportation in was by mule to Monterey to transfer to sailing ships. But King has a plan. His wheat crops were bountiful and there were farmers who wanted to lease land from King to grow wheat. Railroad interests took note. Southern Pacific had extended its line to Soledad and Collis P. Huntington, the renowned railroad magnet, became interested in pushing the tracks further south in quest of King's wheat. In 1886 the tracks of the Southern Pacific Railroad reached King's ranch buildings and the Southern Pacific Milling Company put up a warehouse. Shortly after a flour mill was erected adjacent to the warehouse and "King's Station" began to function as a commercial entity.

In 1887, the first subdivision was built. This laid out a town bounded by San Lorenzo Avenue on the west, by the railroad on the east, by Ellis Street by the north and Pearl Street on the south. In 1895 the area north, west, and south of King's Station was subdivided and new streets added. In 1897, King sold his large holdings to Spreckels Sugar Co. Irrigation brought life to the Salinas Valley and transformed the area into lush green acres of row crops and King City was incorporated in 1911.

F.2.4 POPULATION

The population of King City is 13,332 people (2020 Census), a 3.6% increase in population since 2010. The Association of Monterey Bay Area Governments projects that the City's population will grow to 19,295 by 2025 and 24,726 by 2035. If this projection is accurate, the City of King will experience a faster growth rate in coming decades than any other Salinas Valley city except for Gonzales.

F.2.5 GOVERNING BODY FORMAT

King City has a Council-Manager form of government. The City Council is composed of five Council Members who are elected at large for four- year terms. One Council Member is appointed Mayor for a two-year term by the Council.

F.2.6 ECONOMY AND TAX BASE

The City's economic base is largely dependent upon agriculture with food processing and packing the primary sources of employment. Mee Memorial Hospital and Casey Printing typify other sectors of the business community, and nearby Fort Hunter Liggett also plays a role in the local economy (located 26 miles southeast of the city). The City is development friendly, and through an ambitious economic development strategy that includes expedited permit approvals, continues to attract new businesses and residential housing projects that improve the quality of life in the community.

F.3 PLANNING PROCESS

The City of King followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of King held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on June 22, 2021. Key stakeholders present at the meeting included:

- Steve Adams, City Manager
- Geoff English, Public Works Special Project Coordinator
- Mark McClain, Building Official
- Rory Lakind, Acting Police Captain
- Doreen Liberto, Community Development Director
- Maricruz Aguilar, Assistant Planner
- Keith Boyd, Chief of Police
- Octavio Hurtado, City Engineer
- Ed Lenger, Interim Supervisor, Public Works

F.4 LAND USE AND DEVELOPMENT

The King City General Plan was adopted in 1998. Around 20% of the land is dedicated to residential uses, another 20% is dedicated to agricultural uses, and approximately 25% of the land is dedicated to open space and public-quasi public uses. About 10% of the land is dedicated to industrial use and 6% of the land is dedicated to commercial use.

Due to the City's strategic location along Highway 101, King City has historically served as a retailing and service center for all of Southern Monterey County. Similar to other communities in the Salinas Valley, the City of King is surrounded by some of the best farmland in the nation. In an attempt to protect this land, 6 agricultural conservation easements have been secured to the north and south of the City. It is estimated that over 1,500 acres of farmland that are contiguous to the City limits are restricted by such easements. These easements remove the development potential of these parcels and therefore limit future development to the east and west. The 1998 General Plan generally follows an east- west development pattern.

The City is currently updating their General Plan and has recently adopted master plans and specific plans for key areas of the City, including the Downtown Addition Specific Plan, the West Broadway

Master Plan, the First Street Corridor Master Plan, Historic Corridor Revitalization Plan, Airport Master Plan, San Lorenzo Creek Plan and the East Ranch Business Park Specific Plan. These plans will guide the future of the City and seek to pursue a diverse employment base, expand the tourism industry, and retain the unique identity and historic elements of the City.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The King City Safe Growth Survey was completed by Doreen Liberto, Community Development Director for the City of King Community Development Department. The results are summarized in *Table F-1*.

Table F-1
City of King Safe Growth Survey Results

Topic Area	2021	2016
Land Use	4.75	4.00
Transportation	4.00	3.00
Environmental Management	4.67	3.33
Public Safety	4.67	3.33
Zoning Ordinance	4.25	2.50
Subdivision Regulations	4.33	3.67
Capital Improvement Program & Infrastructure Policies	4.33	3.00
Building Code	5.00	5.00
Economic Development	4.00	3.00
Average Survey Ratings	4.44	3.43

F.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of King's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of King is included in this Annex.

The City of King’s Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City’s Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table F-2* displays the results of the hazard risk ranking exercise that was performed by the King City Planning Team.

Table F-2
Threat Hazard Identification Risk Assessment (THIRA): City of King

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	3.1	2.7	3.0	3.1	11.9	Substantial
Coastal Erosion	-	-	-	-	-	-
Coastal Flooding	-	-	-	-	-	-
Cyber-Attack	2.7	2.6	2.6	2.7	10.5	Substantial
Dam Failure	1.9	1.3	2.1	2.1	7.4	Possible
Drought & Water Shortage	3.4	3.5	3.5	3.5	13.6	High
Earthquake	3.0	3.0	3.0	3.0	12	Substantial
Epidemic	2.8	2.7	2.7	2.8	10.9	Substantial
Extreme Cold & Freeze	2.3	2.2	2.3	2.4	9.3	Moderate
Extreme Heat	3.0	2.9	2.7	2.7	11.2	Substantial
Flash Flood	2.4	2.4	2.6	2.7	10.1	Substantial
Hazardous Materials Incident	2.3	2.0	2.3	2.6	9.2	Moderate
Invasive Species	2.0	2.1	2.0	2.1	8.2	Moderate
Levee Failure	1.4	1.6	1.6	1.4	6.0	Slight
Localized Stormwater Flooding	2.6	2.4	2.9	2.9	10.8	Substantial
Mass Migration	1.4	1.6	1.6	1.6	6.1	Possible
Pandemic	3.0	3.1	3.0	3.1	12.2	High
Riverine Flooding	2.2	2.1	2.1	2.3	8.8	Moderate
Sea Level Rise	-	-	-	-	-	-
Severe Winter Storms	2.0	2.0	2.2	2.2	8.4	Moderate
Slope Failure	1.8	1.7	1.9	1.8	7.1	Possible
Targeted Violence	2.3	2.0	2.2	2.3	8.9	Moderate
Terrorism	1.3	1.3	1.3	1.7	5.7	Slight
Tsunami	-	-	-	-	-	-
Utility Interruption/ PSPS	2.7	2.4	2.4	2.7	10.2	Substantial
Water Contamination	2.1	1.8	2.1	2.4	8.4	Moderate
Wildfire	2.3	2.3	2.2	2.4	9.3	Moderate
Windstorms	1.9	2.0	2.0	2.1	8.0	Possible

F.5.1 AGRICULTURAL EMERGENCIES

The agricultural industry is a major economic driver in the City. Agricultural disasters pose a serious threat to the local economy and populations directly employed by the agriculture industry.

F.5.2 COASTAL EROSION

The City is not located on the coast, and therefore coastal erosion is not a major threat. Coastal erosion does threaten agricultural land in the Salinas Valley, which if impacted could have indirect economic effects on the local economy. The City could also be impacted by other types of erosion not profiled in this Plan.

F.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in the dam inundation zones of the Los Padres and Forest Lake dams. *Table F-3* summarizes population and property in the City exposed to spillway and dam failure of the Nacimiento and San Antonio dams.

Table F-3

Population and Property Exposed to Dam Failure Risk by Dam and Failure Type in King City

Dam Failure Scenario	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Nacimiento Spillway Failure	2,846	312	\$105,249,593	51	\$10,297,446
Nacimiento Dam Failure	4,683	537	\$164,841,810	198	\$68,499,071
San Antonio Spillway Failure	154	0	\$0	6	\$255,399
San Antonio Dam Failure	4,683	533	\$164,003,073	194	\$68,100,945

Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

F.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Drought also is often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic

effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

F.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 2,772 residential and non-residential buildings in the City, with a total value of \$836,661,694. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table F-4* summarizes population and property in the City exposed to liquefaction risk.

Table F-4
Population and Property Exposed Liquefaction Risk in King City

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	2,609	219	\$70,240,535	81	\$7,626,927
Moderate Liquefaction Susceptibility	10,970	1754	\$517,181,864	846	\$268,108,291

F.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. The floodplain of the San Lorenzo Creek and the Salinas River are the areas subject to the most significant hazard. *Table F-5* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table F-5
Population and Property Exposed to Flooding Risk in King City

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	2,124	53	\$21,558,264	55	\$8,515,990
500-Year Flood Zone	9,168	1206	\$344,066,446	743	\$167,246,111

F.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances

will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table F-6 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table F-6 Population and Property Exposed to Hazardous Materials Incident Risk in King City					
Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	10,439	1,545	\$458,379,586	726	\$157,007,523
Fixed Source	8,245	1,356	\$395,797,337	806	\$261,571,752

F.5.8 HUMAN-CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

F.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

F.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip

code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts. FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table F-7*.

Table F-7			
Annualized Frequency and Exposure to Severe Weather Events in King City			
Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.38	Frequency (<i>Distinct Events</i>)	0.13
Exposed Population	5,813	Exposed Population	5,813
Exposed Building Values	\$350,459,000	Exposed Building Values	\$350,459,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$513
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	1.24	Frequency (<i>Distinct Events</i>)	1.28
Exposed Population	5,813	Exposed Population	5,813
Exposed Building Values	\$350,459,000	Exposed Building Values	\$350,459,000
Expected Annual Loss of Building Value	\$2	Expected Annual Loss of Building Value	\$8,959,910
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.06	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	5,813	Exposed Population	0
Exposed Building Values	\$350,459,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$8	Expected Annual Loss of Building Value	\$0
Source: FEMA National Risk Index			

Though the data above indicates that there is no population in the City that is exposed to winter weather, the City's homeless population is exposed and at risk to winter weather hazards. This population is more vulnerable to the impacts of winter weather.

F.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 0 people and \$0 in building value in the City is exposed to landslide risk. Additionally, the City is not susceptible to earthquake induced to landslides.

F.5.12 TSUNAMI

The City is not located in a mapped tsunami inundation zone.

F.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City are exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that are operated by electricity are exposed and vulnerable to utility interruption.

F.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table F-8 summarizes population and property in the City in very high, high, and moderate fire threat areas.

Table F-8
Population and Property Exposed to Wildfire Risk in King City

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	1,421	4	\$3,352,658	11	\$7,807,507
Moderate Fire Threat	4,030	83	\$47,454,042	105	\$30,672,215

The most significant fire risk to the City involves dry vegetation that exists in the riverbed along the Salinas River and San Lorenzo Creek areas, which are adjacent to residential neighborhoods. A number of fires have occurred in that area due to increased heat conditions and human activity in the vegetated areas, which have threatened nearby structures.

F.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures will have direct impacts on public health and infrastructure. Drought, flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the local economy, along with changes to agriculture and crops, which are a critical backbone of the City's economy.

F.6 CAPABILITY ASSESSMENT

The City of King performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table F-9*
- An assessment of administrative and technical capabilities is presented in *Table F-10*
- An assessment of fiscal capabilities is presented in *Table F-11*
- An assessment of education and outreach capabilities is presented in *Table F-12*
- Classifications under various community mitigation programs are presented in *Table F-13*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section F.6.1 in *Table F-14*
- An overall self-assessment of capability is presented in Section F.6.2 in *Table F-15*

Table F-9
Planning and Regulatory Capability

Document		Department	Comments
Planning Documents			
General Plan	☒	• Community Development	Conservation, Open Space and Safety Elements, 3.2 – COS-12 addresses hazard prevention
Capital Improvement Plan	☒	• Public Works	Annual CIP Adopted by City Council
Floodplain Management Plan	☒	• Public Works	General Plan 3.1 - COS- 11 addresses floodplain management
Open Space Management Plan	☒	• Community Development • Recreation Department	Conservation, Open Space and Safety Elements address Open Space Goals and Policies
Stormwater Management Plan	☒	• Public Works	Adopted January 2010, with periodic revisions and annual State reporting
Coastal Management Plan	☐		Not Applicable
Local Coastal Program	☐		Not Applicable
Climate Action/ Adaptation Plan	☐	• Community Development	Climate Change policies in the Land Use Element of the General Plan
Emergency Operations Plan	☒	• City Manager's Office	Adopted 2016
Continuity of Operations Plan	☒	• City Manager's Office	Section #1- Page #47 of Emergency Operations Plan
Community Wildfire Protection Plan	☐	• City Manager's Office	Fire Hazard risk assessment is very limited. Assessment described on page #44 of the Emergency Operations Plan
Evacuation Plan	☐	• City Manager's Office	
Disaster Recovery Plan	☐	• City Manager's Office	
Economic Development Plan	☒	• City Manager's Office • Community Development	The Economic Development Element of the General Plan provides goals and policies. The City also has an Economic Development Strategy which is being updated.
Historic Preservation Plan	☐		
Transportation Plan	☒	• Community Development	Circulation Element of General Plan
Code, Ordinance, & Requirements			
Floodplain Ordinance	☒	• Public Works	MC Chapter 12.16 – Flood Damage Prevention
Zoning Ordinance	☒	• Community Development	MC Chapter 17.36 – Primary Flood Plain District MC Chapter 17.38 – Secondary Flood Plain District

Table F-9
Planning and Regulatory Capability

Document		Department	Comments
Subdivision Ordinance	☒	• Community Development	MC Section 16.12.340 – Findings for approval of subdivision maps located in fire hazard areas
Site Plan Review Requirements	☒	• Community Development	
Unified Development Ordinance	☐		
Post-Disaster Redevelopment/Reconstruction Ordinance	☐	• City Manager's Office	MC Chapter 2.28 – Emergency Services
Building Code	☒	• Building and Safety	Adopted 2019 California State Uniform Building Code
Fire Prevention Code	☒	• Building and Safety	Adopted 2019 California State Fire Code
Other Hazard-Specific Ordinances		• MC Chapter 17.56 – Env. Protection – Pollution Standards • MC Chapter 8.34 – Hazardous Materials Storage & Registration • MC Chapter 7.51 – Nuisances	

Table F-10
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	• Community Development • Public Works	Doreen Liberto, Com. Dev. Dir. Octavio Hurtado, City Engineer
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	• Public Works • Building and Safety	Octavio Hurtado, City Engineer Mark McClain, Building Official
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	• Community Development • Public Works	Doreen Liberto, Com. Dev. Dir. Octavio Hurtado, City Engineer
Building Inspector	☒	• Building and Safety	Mark McClain, Building Official (S.A.P. Post-Earthquake Assessment Certification)
Emergency Manager	☒	• City Manager's Office	Steve Adams, City Manager
Floodplain Manager	☒	• Public Works	Octavio Hurtado, City Engineer
Land Surveyors	☐	• Public Works	The City utilizes outside Land Surveyors for all survey work.
Resource development staff or grant writers	☒	• Community Development	Maricruz Aguilar, Assistant Planner

Table F-10
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Public Information Officer	☒ • Recreation Department	Andrea Wasson, Recreation Coordinator
Scientist(s) familiar with the hazards of the community	☐	The City utilizes outside Consultants and Firms when scientific expertise is required.
Staff with education or expertise to assess the community's vulnerability to hazards	☒ • Community Development • Public Works • Building and Safety	Doreen Liberto, Com. Dev. Dir. Octavio Hurtado, City Engineer Mark McClain, Building Official
Personnel skilled in Geographic Information Systems (GIS)	☐	The City of King has budgeted funds in Fiscal Year 2021/22 for the purchase of GIS Software
Maintenance programs to reduce risk	☒ • Public Works	Annual Street Tree Trimming awarded to local tree trimming services. ¼ of City street trees trimmed annually. All storm drain catch basins cleaned annually in advance of winter storms.
Warning systems/services	☒ • Monterey County • Police Department	The City utilizes NIXLE, the Monterey County Sheriff Dispatch Reverse 911 services. Residents can also receive alerts for severe weather, traffic, and criminal activity
Mutual Aid Agreements	☒ • Police Department • Fire Department • Public Works	Cal WARN. Monterey County Public Safety Allied Agencies Mutual Aid Agreement.

Table F-11
Fiscal Capability

Fiscal Resources	Department	Comments
General Funds	☒ • Finance Department	Mike Howard, Finance Director
Capital Improvements Project Funding	☒ • Public Works • Finance Department	Mike Howard, Finance Director Octavio Hurtado, City Engineer
Special Purpose Taxes	☒ • Finance Department	Mike Howard, Finance Director
Stormwater Utility Fees	☐	
Gas / Electric Utility Fees	☒ • City Manager's Office • Finance Department	Steve Adams, City Manager Mike Howard, Finance Director
Water / Sewer Fees	☒ • City Manager's Office • Finance Department	Steve Adams, City Manager Mike Howard, Finance Director
Development Impact Fees	☒ • City Manager's Office • Finance Department	Steve Adams, City Manager Mike Howard, Finance Director

Table F-11
Fiscal Capability

Fiscal Resources		Department	Comments
General Obligation Bonds	☐	•	
Special Tax and Revenue Bonds	☐	•	
Community Development Block Grants (CDBG)	☒	• City Manager's Office • Finance Department	Steve Adams, City Manager Mike Howard, Finance Director

Table F-12
Education and Outreach Capability

Educational and Outreach Resources		Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☐		Coordinate and utilize the services of the American Red Cross.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒	• City Manager's Office	Periodic Flyers to residents regarding potential hazards, primarily flood related. The City inserts public education articles into the quarterly City newsletter. Additionally, the City uses social media to inform and educate the public.
Natural disaster or safety related school programs	☐		
Public-private partnership initiatives addressing disaster-related issues	☐		

Table F-13
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	4	-	-
StormReady Certification	No	-	-
TsunamiReady Certification	N/A	-	-
Firewise Communities Certification	No	-	-

Political Capability

The City Council for the City of King has a high degree of general willingness to provide political leadership by enacting programs and policies to reduce hazards in the community. As a Council, they have all participated in a training session in their role in the City's Emergency Operations Plan. They

have supported all staff's recommendations involving investment in infrastructure designed to address hazards. They have supported annual funding for the development of an annual long-term sediment removal program in the San Lorenzo Creek, which has been instrumental in reducing flooding hazards.

Probably the most significant commitment is approval of the master plan and wastewater rate increases to fund a new \$45 million wastewater treatment plant project. This will be the largest capital project in the City's history and will substantially improve safety of the plant.

A few other related examples include the adoption and funding of the [Comprehensive Plan to End Youth Violence](#). A second example is the [purchase and installation of a citywide camera system](#) to assist with crime prevention. Although not necessarily focused on Hazard Mitigation planning, the above examples provide evidence of the City Council's willingness to enact programs and policies to reduce risks in the community.

F.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table F-14

National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Octavio Hurtado, City Engineer, Public Works Department
NFIP Community Number:	060199
Flood Insurance Policies in Force:	17
Insurance Coverage in Force:	\$4,318,600
Written Premium in Force:	\$28,721
Total Loss Claims:	12
Total Payments for Losses:	\$715,517
Adopted Regulations that meet NFIP Requirements:	
• Ordinance No. 2010-688- Municipal Code Chapter 12.16 Flood Damage Prevention	
• Ordinance No. 1973- 354 § 4.34.- Municipal Code Chapter 17.36 P-F-Primary Flood Plain District	
• Ordinance No. 1973- 354 § 4.35.- Municipal Code Chapter 17.36 P-F-Secondary Flood Plain District	
• Ordinance No. 1973-780 § 1.- Municipal Code Chapter 12.04 Construction Codes Adopted- California Building Standards Title 24	
• Ordinance No. 1973-355 § 14.00.- Municipal Code Chapter Title 16 Subdivisions	
Date of last NFIP Community Assistance Visit (CAV):	
Prior to the adoption of Ordinance No. 2010-688 on August 10, 2010.	
Higher standards that exceed minimum NFIP requirement:	
No higher standards have been adopted.	
Additional floodplain management provisions:	
No additional floodplain management provisions have been adopted by the City of King.	
Floodplain management activities performed that go beyond FEMA minimum requirements:	
The City of King annually conducts a comprehensive cleaning of the City's storm drain system prior to storm season.	
Existing impediments to running an effective NFIP program:	
None identified.	

Table F-14
National Flood Insurance Program (NFIP) Compliance

Specific actions that are ongoing or considered related to continued compliance with the NFIP:

- The City of King requires Storm Drainage calculations on all new development with the requirement to keep the 100-year storm event within the designed storm drain system.
- All building pad elevations are required to be installed a minimum of 1 ft. above the elevation of the top of curb. Top of curb elevations are designed to retain the 100-year storm event.
- The City of King requires "pad certifications" for all new construction.
- Large development projects adjacent to rivers/ creeks require a Hydrological and Environmental review process component.

F.6.2 SELF-ASSESSMENT OF CAPABILITY

Table F-15
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Moderate
Fiscal Capability	Limited
Education and Outreach Capability	Limited
Political Capability	Moderate
Overall Capability	Moderate

F.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

The major hurdles for the City of King in the hazard mitigation planning are severely limited staff and financial resources. Efforts beyond the confines of current staffing and financial resources would require grant funding and/or external agency cooperation. Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

F.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other

relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments

- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

F.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the King City Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of King are identified below:

- The City's biggest concern is major flooding, based on past experience, and this includes not only the Salinas River but also San Lorenzo Creek (large watershed that rapidly changes conditions during the winter months). Overall flood risk has only increased due to all the debris and vegetation in the Salinas River.
- Past flood damages have occurred to the mobile home park on Division Street and the neighborhood on Villa Drive, despite protective dikes being in place. Recovery and clean-up costs to the city's nearby golf course adjacent to San Lorenzo Creek have also been very high.
- The Highway 101 bridge connection traversing the Salinas River is a critical ingress/egress to the city and is considered the most vulnerable critical infrastructure element.
- The City's wastewater treatment plant is considered at risk to major flood events along the Salinas River. Floodwaters during past events have reached to the top of protective berm which should be raised and strengthened to increase protection against future flood damages and service disruptions. Access to the wastewater treatment plant is also at risk during a storm, which could prevent staff from reaching the plant to implement necessary mitigation measures. An alternative access route is needed.
- San Lorenzo Park is located within the known special flood hazard area, and although maintained mostly as open space there are a number of cultural/museum structures that could be damaged during a major flood event.
- There is potential for serious wildland fire problems along the Salinas River bottom, East of the City near the airport, and west of the City near Pine Canyon. Wildfire is of particular concern if combined with high winds as often experienced through the valley, which could send embers flying into the city and cause major fire hazards, particularly for those structures with shake roofs.

- Five Unreinforced Masonry structures remain in the city along Broadway Street, all of which are privately-owned and have been posted with warning placards.
- A mass casualty event on Highway 101, and the subsequent impact on the flow of traffic on surface streets across the city, is a major concern. Additionally, an incident on an at-grade railroad crossing in the city could sever access between both sides of the city and could cause a major disruption.

F.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The King City Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table F-17* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table F-16* includes the status of actions completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table F-16
City of King Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
1	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary.	Completed/ Ongoing	Completed and ongoing on an as needed basis as part of Environmental Review of discretionary permits
5	Examine and mitigate critical infrastructure that has been identified as currently being too thin to ensure the safe transportation of truck loads within Monterey County.	Completed	The City successfully removed the last remaining thin bridge

7	Develop windstorm building requirements (e.g., fasteners for roof sheathing and singles) in high wind hazard areas.	Completed	The City complies with building code standards to meet wind hazard structural requirements
8	Include provisions for dust erosion control methods in building, grading, and land clearing permits.	Completed	Completed and ongoing as part of Environmental Review process

Table F-17
City of King Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	In Progress/ Short-term	All	As part of the General Plan Update, develop a public outreach program to inform the public about hazard risks in the City. This will include sharing hazard maps included in the Land Use Element with the public.	Priority / High	Community Development	General Funds, Grants
2	Ongoing/ Continuous	Wildfire	Continue to conduct current fuel management programs and investigate and apply new and emerging fuel management techniques.	Priority / High	Fire	General Funds and PDM Grant
3	Ongoing/ Continuous	Flooding	Continue ongoing sediment management and invasive removal in the Salinas River and San Lorenzo Creek to reduce flood risk.	Priority/ High	Public Works	Wastewater/ Stormwater Funds
4	In Progress/ 2-Years	Flooding	Develop an alternative access point to the City's wastewater treatment plant in order to ensure access during large flood events.	Priority/ High	Public Works	Wastewater Funds
5	In Progress/ 3-5 Years	Flooding, Dam Failure	Consider flood and dam inundation hazards when designing and constructing the new wastewater treatment plant.	Priority/ High	Public Works	Wastewater Funds
6	New/ Mid-term	Wildfire	Coordinate with Monterey County in order to reduce fire fuels along the Salinas River bottom.	Priority/ Medium	Public Works, Monterey County	Hazard Mitigation Grants
7	Ongoing/ Continuous	Severe Weather, Windstorms	Continue and expand the City's Tree Trimming program in order to reduce wind hazard risks.	Priority/ High	Public Works	General Funds
8	New/ Long-term	Hazardous Materials Incident, Human-Caused	Upgrade at-grade railroad crossings.	Priority/ Medium	Public Works	Transportation Grants

Table F-17
City of King Hazard Mitigation Action Plan Matrix

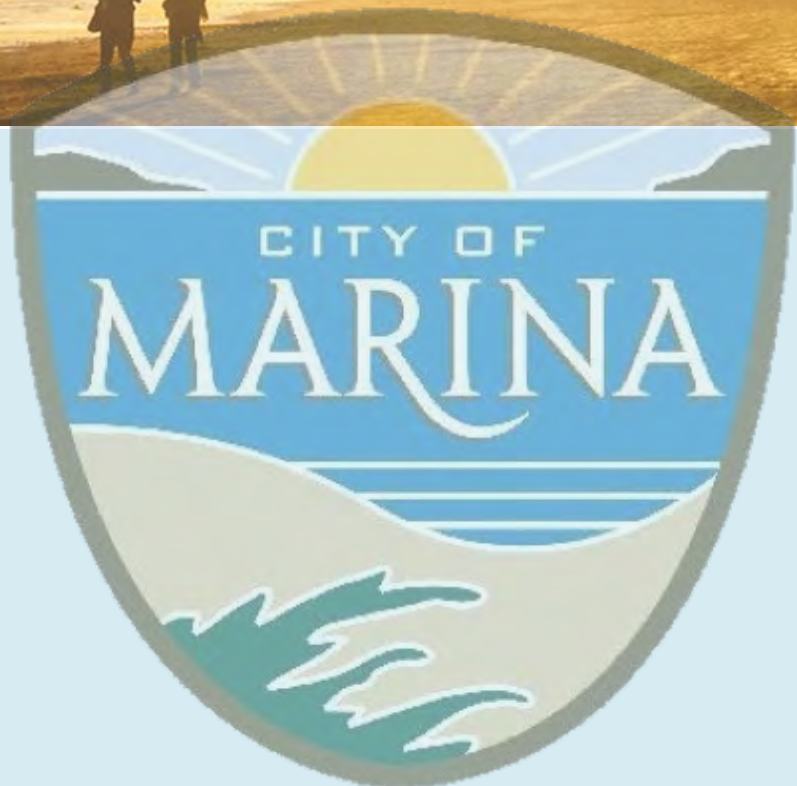
Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
9	New/ Mid-term	All	Install emergency generators and/or emergency battery power systems.	Priority/ High	Public Works	King City Community Power
10	Ongoing/ Continuous	All, Utility Interruptions	When building or renovating facilities, consider identifying opportunities for installing solar panels in order to provide a backup energy source to critical facilities during power outages.	Priority/ Low	Community Development, Public Works	King City Community Power
11	New/ Long-term	Flooding	Develop recommendations for a permanently installed drainage lift station on Villa Drive in order to reduce flood risk in the area.	Priority/ Medium	Public Works	Hazard Mitigation Grants
12	New/ Mid-term	All	Purchase supplies and equipment, such as electronic traffic signage and airport closure signage in order to inform the public of closures due to various hazards.	Priority / Medium	Public Works	General Funds
13	New/ 2-Years	All	Acquire a Fire Engine with a ladder.	Priority/ High	Fire	CDBG Grant
14	New/ Mid-term	All	Upgrade the EOC video board in order to provide increased capacity for real time monitoring and greater interface with the citywide camera system.	Priority/ Medium	Police	General Funds
15	Ongoing/ Continuous	All	Train staff on the use of Nixle and Everbridge for emergency alerts. Continue to provide ICS training and disaster exercises for staff.	Priority/ Medium	Police	General Funds
16	Ongoing/ Continuous	All	Expand disaster preparedness and emergency response training for residents. In the long-term, look into the possibility of creating a CERT Program.	Priority/ Medium	Fire, Police, American Red Cross	General Funds, Grants
17	Ongoing	Drought, Extreme Heat	Provide public information on water conservation and extreme heat.	Priority / Low	Community Development	General Funds, Grants

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ANNEX G: CITY OF MARINA



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



G. CITY OF MARINA

G.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Chief Doug McCoun

Fire Chief, Marina Fire

211 Hilcrest Avenue

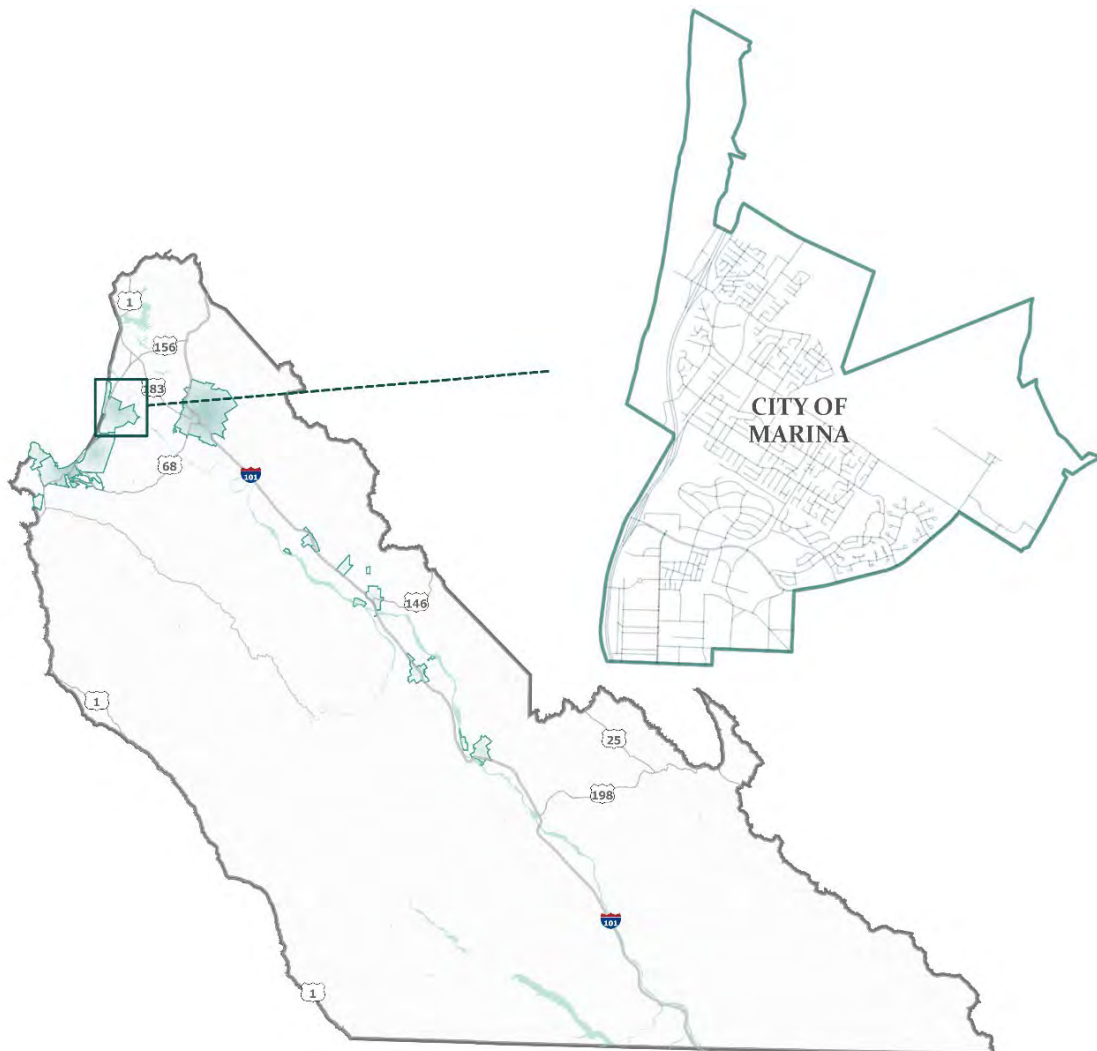
Marina, CA 93933

(831) 275-1700

dmccoun@cityofmarina.org

G.2 COMMUNITY PROFILE

G.2.1 LOCATION



G.2.2 GEOGRAPHY AND CLIMATE

The City of Marina is a small coastal city located along the Monterey Bay. Marina occupies nearly 10 square miles in total area just north of Seaside and west of Salinas. Marina is on California State Route 1 between Monterey and Santa Cruz.

G.2.3 HISTORY

Dating back to (circa) 1868, about 9,000 acres of land stretching north along the Pacific Ocean, and east along the Salinas River, was owned by the late David Jacks and James Bardin. The land block breakup began in 1885, when the Bardin heirs sold 1,372 ½ acres to John Armstrong for farmland and grazing. About a year later, 1,450 acres was sold, then named the Sand Hill Ranch, and then 400 hundred acres near the ocean was sold to the San Francisco Sand Company, which subsequently constructed a sand plant in 1906.

In 1915, real estate salesman William Locke-Paddon from San Francisco was looking for land to subdivide and found the breakup of the large Bardin and Jacks estate as an opportunity. On May 29, 1915, Locke-Paddon purchased 1500 acres south of Sand Hill Ranch designated as the “Pueblo Tract No. 1, City Lands of Monterey.” The Marina Post Office was established in 1919 and by 1926 the town had grown to their first 70 families. The City's history is intertwined with that of Fort Ord Military Base. Major growth during the 1940s, made some impact on the community of Marina, as it became a “rest and relaxation” area for troops stationed at Fort Ord. Throughout the 50s, 60s, and 70s, the City continued to grow with new residential, commercial, industrial, and visitor-serving development being built. Marina voters approved incorporation on November 5, 1975, making Marina the newest City along the Monterey Coast. Since incorporation, the City has continued to grow and flourish.

G.2.4 POPULATION

The City of Marina has a population of 22,359 people (2020 Census), an increase of 13.4% since 2010. The Association of Monterey Bay Area Governments (AMBAG) estimates Marina's current population to increase to approximately 30,130 in 2025 (a 54.9% increase), and approximately 32,940 in 2035 (a 59.4% increase). These dramatic increases are primarily associated with the planned development of housing on the former Fort Ord.

G.2.5 GOVERNING BODY FORMAT

The City of Marina's form of government is a council-manager form of government with a Home-Rule City Charter. The five Council members are elected at large with one being Mayor. The Mayor is elected every two years in a general election held in November of even-numbered years. Serving with the Mayor are four members of the City Council who have overlapping terms; every two years, two members of the City Council are also selected by the voters through a general election. The City Manager is appointed by the City Council to manage the daily operations and is responsible for making policy recommendations to the City Council and implementing City Council policy directives.

G.2.6 ECONOMY AND TAX BASE

The economy of this community is based on tourism and local services. The city includes several miles of shoreline along Monterey Bay, though most of the beach is preserved as public park space and

nearly all development is landward of the coastal dunes and US Highway 1. The city is contiguous with the former Fort Ord military installation, an area experiencing and targeted for future infill growth and redevelopment including more than 1,000 new homes, a number of large mixed-use projects, and a new business center at the former military airport which the City now owns. Through these and other recent commercial and industrial developments, Marina is undergoing transition from a small, primarily bedroom community to a more diversified, vibrant, and self-sufficient community.

G.3 PLANNING PROCESS

The City of Marina followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process. The City of Marina held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on August 31, 2021. Key stakeholders present at the meeting included:

- Layne Long, City Manager
- Doug McCoun, Fire Chief
- Brian McMinn, Public Works Director
- Fred Aegerter, Community Development Director
- Matt Mogensen, Assistant City Manager
- Marisol Gomez, Acting Finance Director
- Tino Nieto, Police Chief

G.4 LAND USE AND DEVELOPMENT

The City of Marina General Plan was adopted in 2000. The City has about three miles of shoreline fronted by restored coastal dune habitat. The coastal zone inland of Highway 1 is limited to roughly 60 acres that includes commercial development, visitor-serving overnight accommodations, coastal dunes, and three significant coastal wetlands. The City received a grant from the Coastal Commission in 2017 and is currently in the process of a comprehensive update to their Local Coastal Program to address sustainable development, increased opportunities for coastal access and recreation, and vulnerability to climate change and sea level rise. The City is also including provisions that embrace the concept of managed retreat.

The City gained land as part of the Fort Ord reuse, which includes several miles of shoreline along Monterey Bay, though most of the beach is preserved as public park space and nearly all development is landward of the coastal dunes and US Highway 1. The former Fort Ord land is an area experiencing and targeted for future infill growth and redevelopment including more than 1,000 new homes, a number of large mixed-use projects, and a new business center at the former military airport which the City now owns. Through these and other recent commercial and industrial developments, Marina is undergoing transition from a small, primarily bedroom community to a more diversified, vibrant, and self-sufficient community.

Marina's Urban Growth Boundary protects the City of Marina from development in current open space areas north of the City limits and along its coast, and to encourage efficient development in central

Marina and within Marina's portion of former Fort Ord, On June 16, 2020, the City Council of the City of Marina adopted Resolution 2020-75, submitting to the voters at the November 3, 2020 General Municipal Election a Measure approving a General Plan Amendment and Local Coastal Program Amendment extending the expiration date of the operative provisions of the 2000 Marina Urban Growth Boundary Initiative to December 31, 2040.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**. The City of Marina Safe Growth Survey was completed by Christy Hopper, Planning Services Manager for the City of Marina Community Development Department. The results are summarized in Table G-1.

Table G-1
City of Marina Safe Growth Survey Results

Topic Area	2021	2016
Land Use	3.50	3.50
Transportation	4.33	3.00
Environmental Management	4.67	3.33
Public Safety	4.00	4.00
Zoning Ordinance	4.75	2.50
Subdivision Regulations	2.33	2.67
Capital Improvement Program & Infrastructure Policies	3.33	3.00
Building Code	5.00	4.00
Economic Development	5.00	3.00
Average Survey Ratings	4.10	3.22

G.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Marina's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Marina is included in this Annex.

CITY OF MARINA Multi-Jurisdictional Hazard Mitigation Plan

The City of Marina's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table G-2* displays the results of the hazard risk ranking exercise that was performed by the City of Marina's Planning Team.

Table G-2
Threat Hazard Identification Risk Assessment (THIRA): City of Marina

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	1.6	1.4	1.4	1.4	5.8	Slight
Coastal Erosion	2.8	2.7	2.5	2.5	10.5	Substantial
Coastal Flooding	2.0	1.8	1.8	2.2	7.8	Possible
Cyber-Attack	2.4	2.2	2.2	2.4	9.2	Moderate
Dam Failure	-	-	-	-	-	-
Drought & Water Shortage	2.7	2.7	2.5	2.7	10.5	Substantial
Earthquake	3.0	2.8	2.8	3.0	11.7	Substantial
Epidemic	2.3	2.3	2.3	2.3	9.3	Moderate
Extreme Cold & Freeze	1.2	1.3	1.3	1.2	5.0	Slight
Extreme Heat	1.8	1.7	1.8	1.5	6.8	Possible
Flash Flood	1.5	1.3	1.2	1.3	5.3	Slight
Hazardous Materials Incident	2.2	2.0	2.0	2.0	8.2	Moderate
Invasive Species	2.2	2.0	1.8	1.7	7.7	Possible
Levee Failure	-	-	-	-	-	-
Localized Stormwater Flooding	2.0	2.0	1.8	1.7	7.5	Possible
Mass Migration	1.8	1.8	2.0	2.0	7.7	Possible
Pandemic	2.7	2.7	2.5	2.5	10.3	Substantial
Riverine Flooding	1.7	1.3	1.7	1.3	6.0	Slight
Sea Level Rise	2.7	3.2	2.5	2.7	11.0	Substantial
Severe Winter Storms	2.0	1.7	2.0	2.2	7.8	Slight
Slope Failure	1.5	1.5	1.7	1.7	6.3	Possible
Targeted Violence	2.0	2.0	2.0	2.0	8.0	Possible
Terrorism	1.5	1.5	1.5	1.5	6.0	Possible
Tsunami	2.0	2.2	2.3	2.3	8.8	Moderate
Utility Interruption/ PSPS	2.7	2.5	2.2	2.2	9.5	Moderate
Water Contamination	2.5	2.0	2.2	2.0	8.7	Moderate
Wildfire	2.8	2.5	2.5	2.7	10.5	Substantial
Windstorms	2.2	2.2	2.2	2.5	9.0	Moderate

G.5.1 AGRICULTURAL EMERGENCIES

There is no agricultural land located within the City, so therefore an agricultural emergency does not pose a direct threat. Since agriculture is a major economic driver in the County, an agricultural emergency could have indirect economic impacts on the City.

G.5.2 COASTAL EROSION

Natural dune erosion from large storm waves is the primary hazard challenging the Marina shoreline. To determine coastal erosion risk, USGS Pacific Coastal and Marine Science Center Coastal Storm Modeling System (CoSMos) shoreline change, and cliff retreat projection data was used. For cliff retreat modeling an end of century (2100) forced sea level rise amount of 200 cm was used based on Ocean Protection Council (OPC) High Risk Aversion Guidance. For shoreline change, winter erosion uncertainty modeling was used to capture the degree of uncertainty associated with future shoreline erosion. Hold the Line scenario modeling was chosen for both types of erosion.

Three sea level rise levels (25 cm, 75 cm, and 200 cm) to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Table G-3 summarizes population and property exposure to coastal erosion risk.

Table G-3
Population and Property Exposed to Coastal Erosion Risk in Marina

Sea Level Rise Scenario/ Erosion Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Cliff Erosion					
Sea Level Rise (25 cm)	0	0	\$0	0	\$0
Sea Level Rise (75 cm)	0	0	\$0	0	\$0
Sea Level Rise (200 cm)	0	0	\$0	0	\$0
Shoreline Erosion					
Sea Level Rise (25 cm)	34	0	\$0	20	\$45,275,418
Sea Level Rise (75 cm)	34	0	\$0	20	\$45,275,418
Sea Level Rise (200 cm)	34	0	\$0	20	\$45,275,418

Coastal dune erosion hazards are the biggest threat to the City of Marina, with potentially up to five feet of sea level rise. The primary impact from this erosion will be to open space, recreation, and dune habitats along Marina State Beach. Infrastructure and facilities projected to be eroded and damaged include Marina Coast Water District facilities, some portions of the wastewater conveyance system including a sewer pump station and an (aging/ phasing out) water treatment facility, the Sanctuary Beach Resort, one groundwater supply well, and the coastal access and associated parking lot at Marina State Park.

Reduction of erosion rates from the recent cessation of sand mining is expected to reduce the risk of sea level rise and erosion impacts to the City.

G.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in the dam inundation zones of the Los Padres and Forest Lake dams.

Table G-4 summarizes population and property in the City exposed to spillway and dam failure of the Nacimiento and San Antonio dams.

Table G-4 Population and Property Exposed to Dam Failure Risk by Dam and Failure Type in Marina					
Dam Failure Scenario	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Nacimiento Spillway Failure	5	1	\$199,341	2	\$87,938
Nacimiento Dam Failure	39	1	\$199,341	16	\$45,275,418
San Antonio Spillway Failure	5	1	\$199,341	1	\$0
San Antonio Dam Failure	5	1	\$199,341	2	\$87,938

Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

G.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

G.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 4,991 residential and non-residential buildings in the City, with a total value of \$2,745,331,711. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table G-5* summarizes population and property in the City exposed to liquefaction risk.

Table G-5
Population and Property Exposed to Liquefaction Risk in Marina

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	39	1	\$199,341	21	\$45,275,418
Moderate Liquefaction Susceptibility	516	16	\$9,411,509	29	\$57,441,079

G.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table G-6* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table G-6
Population and Property Exposed to Flooding Risk in Marina

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	9,496	96	\$55,762,807	98	\$89,907,734
500-Year Flood Zone	436	0	\$0	5	\$0

G.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table G-7 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table G-7
Population and Property Exposed to Hazardous Materials Incident Risk in Marina

Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	16,292	2,413	\$1,483,891,351	1,018	\$515,933,364
Fixed Source	443	0	\$0	4	\$28,649,394

G.5.8 HUMAN-CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

G.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

G.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage.

All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts.

FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table G-8*.

Table G-8
Annualized Frequency and Exposure to Severe Weather Events in Marina

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.34	Frequency (<i>Distinct Events</i>)	0.09
Exposed Population	15,069	Exposed Population	15,069
Exposed Building Values	\$1,244,655,000	Exposed Building Values	\$1,244,655,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$219
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	0.08	Frequency (<i>Distinct Events</i>)	1.31
Exposed Population	15,069	Exposed Population	10,187
Exposed Building Values	\$1,244,655,000	Exposed Building Values	\$749,974,394
Expected Annual Loss of Building Value	\$1	Expected Annual Loss of Building Value	\$19,235,838
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.42	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	15,069	Exposed Population	0
Exposed Building Values	\$1,244,655,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$179	Expected Annual Loss of Building Value	\$0
Source: FEMA National Risk Index			

G.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 1,634 people and \$192,621,122 in building value in the City is exposed to landslide risk. Additionally, the City is not susceptible earthquake induced to landslides.

G.5.12 TSUNAMI

Population and property in the City located in a mapped tsunami inundation zone is summarized in *Table G-9*.

Table G-9
Population and Property in Tsunami Inundation Zone in Marina

Inundation Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Tsunami Inundation Zone	34	0	\$0	20	\$45,275,418

G.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption.

G.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table G-10 summarizes population and property in the City in very high, high, and moderate fire threat areas.

Table G-10
Population and Property Exposed to Wildfire Risk in Marina

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	3,256	6	\$3,505,063	13	\$37,060,120
Moderate Fire Threat	13,699	574	\$458,626,555	492	\$379,314,058

G.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure. Drought, coastal and inland flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the rural economies, along with changes to agriculture and crops, which are a critical backbone of Monterey County's economic success. There will also be negative impacts to ecosystems, both on land and in the ocean, leading to local extinctions, migrations, and management challenges.

Sea level rise risk exposure in the City was calculated based on the NOAA Office for Coastal Management [sea level rise viewer](#) projections. Three sea level rise levels (25 cm, 75 cm, and 200 cm) were chosen to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Population and property exposed to sea level rise risk is summarized in *Table G-11*.

Table G-11
Population and Property Exposed to Sea Level Rise in Marina

Sea Level Rise Amount	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
1 ft Sea Level Rise (2030)	34	0	0	20	\$45,275,418
3 ft Sea Level Rise (2060)	34	0	0	20	\$45,275,418
7 ft Sea Level Rise (2100)	34	1	\$199,341	21	\$45,275,418

G.6 CAPABILITY ASSESSMENT

The City of Marina performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table G-12*
- An assessment of administrative and technical capabilities is presented in *Table G-13*
- An assessment of fiscal capabilities is presented in *Table G-14*
- An assessment of education and outreach capabilities is presented in *Table G-15*
- Classifications under various community mitigation programs are presented in *Table G-16*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section G.6.1 in *Table G-17*
- An overall self-assessment of capability is presented in Section G.6.2 in *Table G-18*

Table G-12
Planning and Regulatory Capability

Document		Department	Comments
Planning Documents			
General Plan	☒	• Community Development	
Capital Improvement Plan	☒	• Public Works	
Floodplain Management Plan	☒	• Public Works	
Open Space Management Plan	☒	• Public Works	Under Development and will be addressed with the General Plan update.
Stormwater Management Plan	☒	• Public Works	
Coastal or Shoreline Management Plan	☒	• Community Development	Being updated to address Sea Level rise and Coastal Hazards, 2019 Existing Conditions and Sea Level Rise Adaptation Report
Local Coastal Program	☒	• Community Development	Certified in 1982, Currently being updated to address Sea Level rise and Coastal Hazards
Climate Action/ Adaptation Plan	☒	• Community Development	Under development, working with AMBAG for final adoption with the General Plan update
Emergency Operations Plan	☒	• Fire Department	Regional EOC
Continuity of Operations Plan	☒	• Fire Department	
Community Wildfire Protection Plan	☒	• Fire Department	County Wide Plan
Evacuation Plan	☒	• Fire Department	County Wide, Local Tsunami
Disaster Recovery Plan	☐	•	
Economic Development Plan	☒	• City Administration	In General Plan

Table G-12
Planning and Regulatory Capability

Document		Department	Comments
Historic Preservation Plan	☒	• Community Development	In General Plan
Transportation Plan	☒	• Public Works	Part of the General Plan and part of TAMC
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	• Public Works	Ordinance 15.48 – Flood Damage Prevention
Zoning Ordinance	☒	• Community Development	
Subdivision Ordinance	☒	• Community Development	
Site Plan Review Requirements	☒	• Community Development	
Unified Development Ordinance	☐		N/A
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐		N/A
Building Code	☒	• Community Development	
Fire Prevention Code	☒	• Fire Department	
Other Hazard-Specific Ordinances		• Ordinance 8.46 – Urban Storm Water Quality Management and Discharge Control	

Table G-13
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	• Community Development • Public Works	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	• Community Development • Public Works	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	• Community Development • Public Works	
Building Inspector	☒	• Community Development	
Emergency Manager	☒	• City Manager	
Floodplain Manager	☒	• Public Works	Public Works Director
Land Surveyors	☒	• Public Works	Public Works Director
Resource development staff or grant writers	☐		
Public Information Officer	☒	• Police Department	Police Chief
Scientist(s) familiar with the hazards of the community	☐		

Table G-13
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Staff with education or expertise to assess the community's vulnerability to hazards	☒ • All Departments	
Personnel skilled in Geographic Information Systems (GIS)	☐	
Maintenance programs to reduce risk	☒ • Public Works	
Warning systems/services	☒ • Monterey County	
Mutual Aid Agreements	☒ • Fire Department • Public Works	

Table G-14
Fiscal Capability

Fiscal Resources	Department	Comments
General Funds	☒ • Finance	
Capital Improvements Project Funding	☒ • Public Works	
Special Purpose Taxes	☒ • Finance	
Stormwater Utility Fees	☐	
Gas / Electric Utility Fees	☐	
Water / Sewer Fees	☐	
Development Impact Fees	☒ • Community Development	
General Obligation Bonds	☒ • City Manager • Finance	
Special Tax and Revenue Bonds	☒ • City Manager • Finance	
Community Development Block Grants (CDBG)	☐	

Table G-15
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒ • Mayor's Office	
Ongoing public education or information program (e.g.,	☒ • Police Department • Fire Department	All Departments

Table G-15
Education and Outreach Capability

Educational and Outreach Resources		Department	Comments
responsible water use, fire safety, household preparedness, environmental education)		- Public Works - Community Development	
Natural disaster or safety related school programs	☒	Parks and Recreation	
Public-private partnership initiatives addressing disaster-related issues	☐		

Table G-16
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	Yes	3/3Y	October 1, 2014
<i>StormReady</i> Certification	Yes	-	
<i>TsunamiReady</i> Certification	Yes	-	
<i>Firewise Communities</i> Certification	No	-	-

G.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table G-17
National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Brian McMinn, Public Works Director
NFIP Community Number:	060727
Flood Insurance Policies in Force:	45
Insurance Coverage in Force:	\$13,664,400
Written Premium in Force:	\$61,833
Total Loss Claims:	0
Total Payments for Losses:	0
Adopted Regulations that meet NFIP Requirements:	- Ordinance 15.48 – Flood Damage Prevention - Ordinance 8.46 – Urban Storm Water Quality Management and Discharge Control
Date of last NFIP Community Assistance Visit (CAV):	Research indicates the last contact with the CAC was in 2010. There is no evidence of compliance issues from that time.
Higher standards that exceed minimum NFIP requirement:	N/A
Additional floodplain management provisions:	The soils in the City of Marina are mostly sand which lends itself towards flood prevention. On top of the naturally good infiltration rates, the City's storm water standards exceed those of the State with a

design retention for all new development and redevelopment with 100% retention of the 100-year storm event.

Floodplain management activities performed that go beyond FEMA minimum requirements:

The City follows the State requirements for on-site mitigation of storm events. City requirements exceed those of the State with a retention requirement of 100% of all on-site runoff for the 100-year storm event. The Design Engineer of every major project in the City must sign off on a self-certification that they meet the City's requirements for on-site retention. The City's website is updated on an annual basis for training opportunities in post-construction Best Management Practices (BMPs) for stormwater collection and retention. The City also conducts an annual audit of its Municipal Code to confirm the information provided is up to the latest State mandates.

Existing impediments to running an effective NFIP program:

None

Specific actions that are ongoing or considered related to continued compliance with the NFIP:

- Maintain digital FEMA elevation certificates for all construction in the floodplain.
- Encourage or require certain local staff positions to obtain and maintain Certified Floodplain Manager (CFM) certification.
- Hold informative work sessions for newly elected officials and new appointees to planning commissions and appeals/variance boards, to provide an overview of floodplain management, the importance of participating in the NFIP, and the implications of failing to enforce the requirements of the program or failing to properly handle variance requests.
- Obtain FEMA's Substantial Damage Estimator and attend training to be prepared to use it when damage occurs; develop mutual aid agreements with other jurisdictions to augment local inspection personnel after major disasters.
- Maintain supplies of FEMA/NFIP materials to help property owners evaluate measures to reduce potential hazard damage. Make available in public buildings, local library, website, etc. and inform people who they can call to learn more information.

G.6.2 SELF-ASSESSMENT OF CAPABILITY

Table G-18
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Moderate
Fiscal Capability	High
Education and Outreach Capability	Moderate
Political Capability	Moderate
Overall Capability	Moderate

G.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Staffing is the largest limitation to capability. Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

G.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.
- **2019 Existing Conditions and Sea Level Rise Adaptation Report:** Includes the principles of hazard mitigation to address sea level rise risk.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and

expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

G.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Marina Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Marina are identified below:

- The City continues to grow, with many new development projects underway or scheduled for the former site of Fort Ord but continues to be very concerned with maintaining a sustainable water supply – concerns that have only been exacerbated by the anticipated effects of climate change, including saltwater intrusion. It continues to coordinate and share these concerns the Monterey County Water Resources Agency and the Marina Coast Water District.

- The City experiences coastal storm events in March/April, with extreme winds that have caused significant tree damages and heavy rains that have caused isolated/localized nuisance flooding due to inadequate drainage systems.
- The Sanctuary Beach Resort is one of the only developed parcels in the city located seaward of Highway 1. There is local concern that coastal erosion and sea level rise could have a detrimental impact on the continued use of the property.
- Coastal erosion (potentially up to 5 to 7 feet a year) is a concern for areas such as Marina Coast Water District at 100 Reservation Road and potentially the former Cemex Sandplant site on Lapis Road toward the north of central Marina.
- The City is concerned about the high threat of wildland fire due to existing fuels in combination with large areas of urban/wildland interface and intermix. Areas of concern include former Fort Ord lands, areas on the east end of the City around the airport and near Imjin Road, undeveloped land within the City, and areas near Reservation Road. The City is working to address some of these areas through fuel management practices.
- The City is concerned with limited ingress/egress to the community following major disaster events. Current traffic levels, highway capacity, gridlock, and lack of mass transit options would make a large evacuation difficult and also limit emergency response capabilities.

G.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Marina Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table G-20* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table G-19* includes the status of actions completed or removed from the previous plan. In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table G-19
City of Marina Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
1	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary.	Completed	Completed and ongoing as needed. Annual hazardous materials inspections are conducted by Monterey County Environmental Health in conjunction with the Public Works Supervisor at the City Corporation Yard (5th Avenue), the Lake Drive Corporation Yard (3040 Lake Court) and the fuel farm at the Marina Municipal Airport.

Table G-20
City of Marina Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing/ Continuous	All	Continue emergency preparedness and hazard mitigation public outreach, including the Annual Safety Night Out, school outreach programs, meeting with community groups, and providing information related to disaster preparedness, Alert Monterey County, and tsunamis, earthquake, fire, and flood safety on the City's website.	Priority / High	Public Safety	General Funds, HMGP and PDM Grants
2	Ongoing/ Continuous	Flooding	Explore mitigation opportunities for repetitively flooded properties, and if necessary, carry-out acquisition, relocation, elevation, and flood-proofing measures to protect these properties.	Priority / High	Public Works	HMGP and PDM Grants
3	Ongoing/ Continuous	Flooding	Identify and carry-out minor flood and stormwater management projects that would reduce damage to infrastructure and damage due to local flooding/ inadequate drainage. These include the modification of existing culverts and bridges, upgrading capacity of storm drains, upgrading aging storm drain infrastructure, upgrading corrugated metal pipes, and creation of stormwater retention basins in small watersheds.	Priority / High	Public Works	HMGP and PDM Grants
4	Ongoing	Wildfire, Utility Interruption	Adopt more prescriptive rules relative to the construction and maintenance of overhead lines.	Priority / High	Community Development, Planning Services	General Funds
5	In Progress	All	During the next General Plan Update, within the Safety Element, collect background data specific to Marina and consider appropriate goals, policies, and objectives to address hazards identified within the Multi-Jurisdictional Hazard Mitigation Plan.	Priority / Medium	Community Development, Planning Services	General Plan

Table G-20
City of Marina Hazard Mitigation Action Plan Matrix

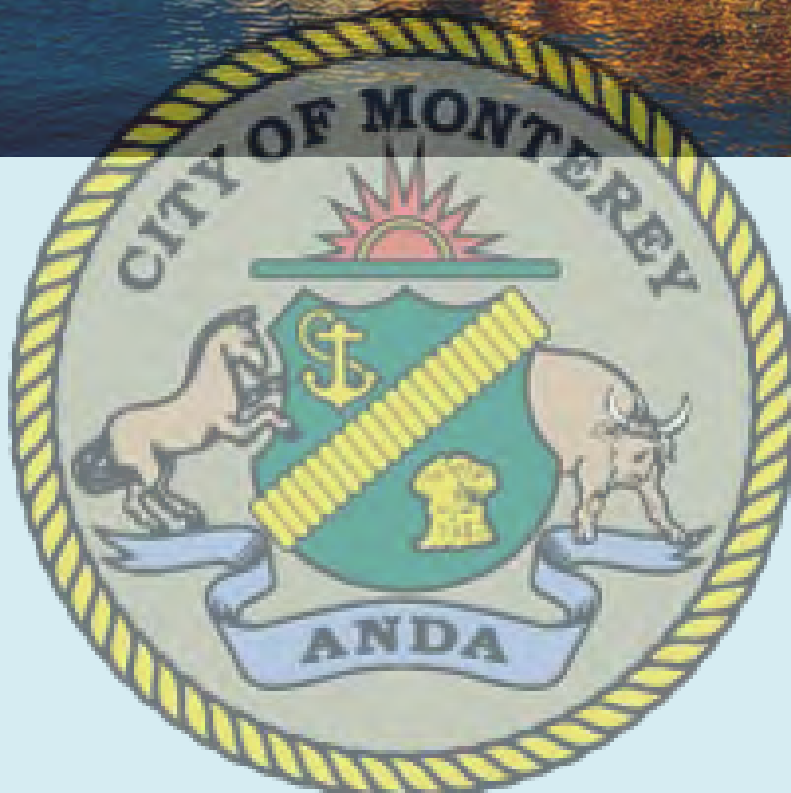
Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
6	In Progress	All	Continue to collaborate with CSUMB and the City of Seaside to provide resources for the organization, staffing, training, activation, and operation of the joint Regional Emergency Operations Center (EOC).	Priority / High	Fire Department, Administration	Cost share as identified in the MOA & grant opportunities
7	In Progress	Flooding, Coastal Erosion, Sea Level Rise	Complete Local Coastal Program Update, which address sea level rise and coastal hazards.	Priority / Medium	Community Development, Planning Services	General Plan
8	In Progress	Wildfire	Continue defensible space projects on high hazard areas on the east side of the City and on University of Santa Cruz owned property.	Priority / High	Fire Department, Public Works	General Fund
9	Ongoing/ Continuous	Wildfire	Continue coordination with Monterey County Regional Fire and CAL FIRE BEU on both wildfire mitigation and suppression efforts.	Priority / Medium	Fire Department	General Fund
10	In Progress	Hazardous Materials Incidents	Complete study on the Monterey Peninsula Landfill to identify and address odor and the impacts of the industrial facilities on the North end of the City of Marina.	Priority / High	Public Works	General Fund

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ANNEX H: CITY OF MONTEREY



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



H. CITY OF MONTEREY

H.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

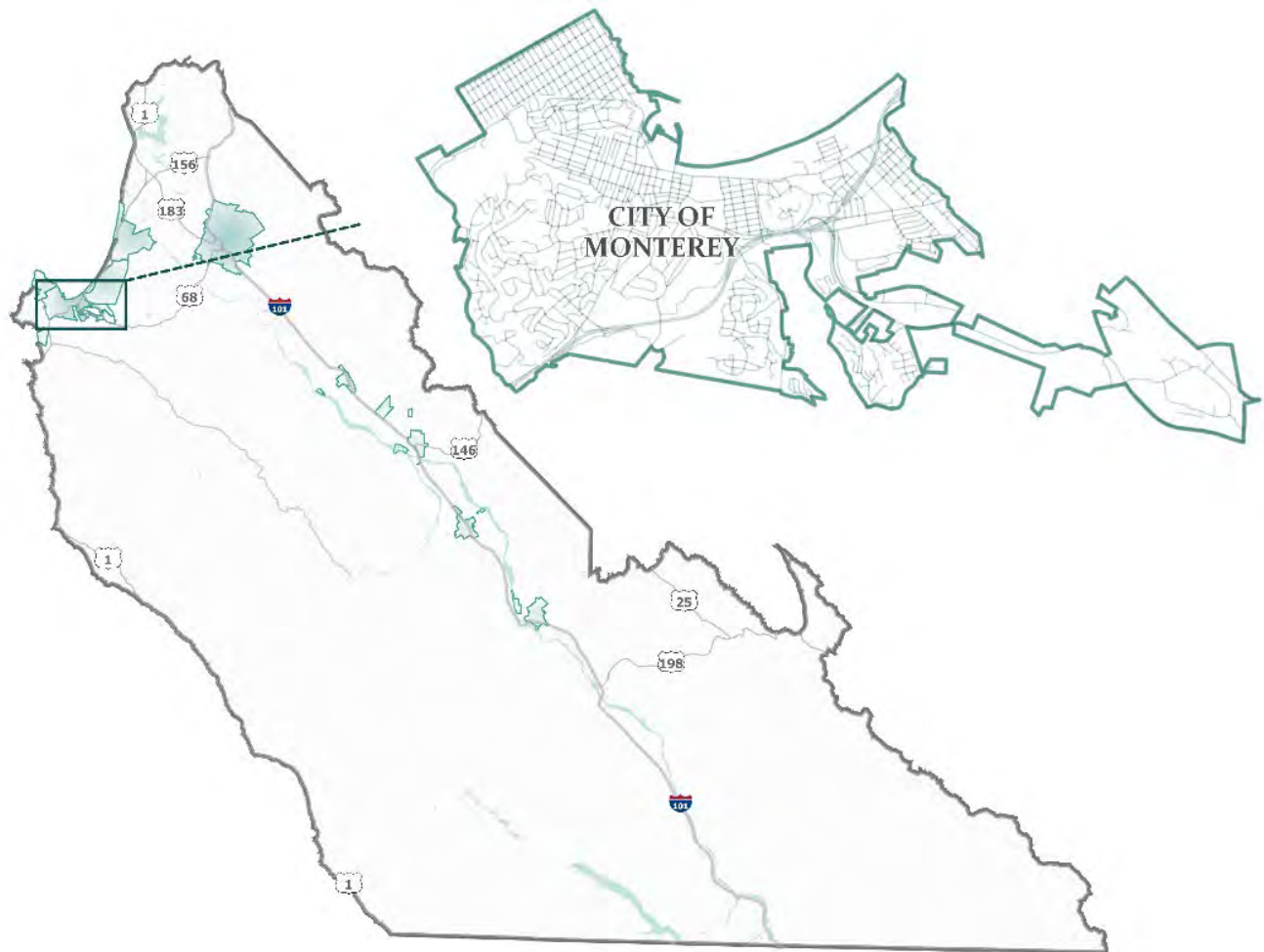
Gaudenz Panholzer
Fire Chief
Monterey Fire Department
610 Pacific Street
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(831) 646-3900
panholzer@monterey.org

Alternate Point of Contact

Nat Rojanasathira
Assistant City Manager
Monterey City Manager's Office
580 Pacific Street
Monterey, CA 93940
(831) 646-3760
rojanasathira@monterey.org

H.2 COMMUNITY PROFILE

H.2.1 LOCATION



H.2.2 GEOGRAPHY AND CLIMATE

Monterey is a popular waterfront city located on the southern edge of Monterey Bay, occupying nearly nine square miles between the cities of Seaside and Pacific Grove. It has a rich history, serving as California's first capital city and later the center of a thriving fishing industry. Its renowned scenic environment stems from its Peninsula coastline and central ridge of wooded hills, coupled with a broad range of historic buildings, antique adobes, and other culturally significant sites.

H.2.3 HISTORY

The area that is today the City of Monterey, was originally inhabited by Costanoan Indians, and in 1542 it was first seen by the Spanish explorer Juan Rodríguez Cabrillo. In 1602 Sebastián Vizcaíno named the area in honor of the count de Monte Rey, viceroy of New Spain (Mexico). The Royal Presidio de San Carlos de Monterey was established on June 3, 1770, and Monterey functioned as the capital of Alta California under both Spain (1774 to 1822) and Mexico (1822 to 1846). Under Mexico, Monterey remained the capital of a vast area that included all of present-day California and the American Southwest. In 1846, Commodore John Drake Sloat claimed the area for the United States and raised the American flag over the town's presidio during the Mexican War. The first constitutional convention in California met at Colton Hall in 1849. The City of Monterey was first incorporated in 1850. Monterey served as county seat of Monterey County until 1873, when the seat was moved to nearby Salinas.

H.2.4 POPULATION

The City of Monterey has a population of 30,218 people (2020 Census), an increase of 8.7% since 2010.

H.2.5 GOVERNING BODY FORMAT

The City of Monterey is a Charter City that operates with a Council/City Manager form of Government. The Council consists of five members: The Mayor, elected to a two-year term, and four council members, elected to four-year terms. The Mayor is elected at-large and Council Members are elected by district. The City Council appoints the City Manager and City Attorney. The City Manager serves as the professional administrator of the City and is responsible for coordinating all day-to-day operations and administration. The City Manager appoints a professional staff to manage the organization.

H.2.6 ECONOMY AND TAX BASE

The City Monterey was once a leading fishing and whaling port, but its economic mainstay is now tourism. The City of Monterey is widely known for its numerous tourist attractions including the Monterey Bay Aquarium, Cannery Row, and Fisherman's Wharf. It is also home to major military installations including the Naval Postgraduate School and the Defense Language Institute, located on the Presidio of Monterey.

H.3 PLANNING PROCESS

The City of Monterey followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Monterey held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on July 19, 2021. Key stakeholders present at the meeting included:

- Nat Rojanasathira, Assistant City Manager
- Gaudenz Panholzer, Fire Chief
- Christy Sabdo, Associate Planner
- Lori Lynn Williamson, Chief Building Official
- Karen Larson, Parks & Recreation Director
- Sara South, Capital Programs Coordinator
- Ursula Glick-Kelley, GIS Coordinator
- Tricia Wotan, Environmental Regulations Manager
- Andrea Renny, City Traffic Engineer
- Justin Prouty, Urban Forester
- Louis Marcuzzo, Parks Operations Manager
- Angie Blake, Assistant Director of Information Resources

H.4 LAND USE AND DEVELOPMENT

The City of Monterey covers 8.4 square miles of land area. Approximately 3.5 square miles of water area in Monterey Bay is also within the incorporated City. Monterey's growth and development stems from these physical features, including a downtown commercial district on the flatter old marsh area, lighter commercial, and medium-density residential on the sloping mesas, a mixed-use waterfront with numerous retail and recreational activities, neighborhoods separated by wooded canyons, and low density residential in the steep wooded foothills.

The General Plan was adopted in 2005. The largest land use category is residential and single-family homes occupy the vast majority of residential land. The main commercial areas are the downtown area, focused around three-block-long Alvarado Street; Del Monte regional shopping center; commercial development along Lighthouse Avenue, Del Monte Avenue, and North Fremont Street; visitor-serving commercial in downtown, Cannery Row, Fisherman's Wharf, and along Munras Avenue; and medical offices concentrated around the Pacific-El Dorado-Cass Street Area. Since 1994, the City's zoning standards have encouraged mixed-use commercial and residential in commercial zones. Industrial land in the City is concentrated in the area adjacent to and east of the Monterey Peninsula Airport. Military and other public facilities, including streets, highways, and schools, cover 46% of the City's land area. The City has been consistent in its efforts to protect and maintain a wide range of aesthetic physical features, including forested hillsides, greenbelts, creek corridors, parks, beaches, and shoreline.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The Monterey Safe Growth Survey was completed by Christy Sabado, Associate Planner in the City of Monterey Community Development Department. The results are summarized in *Table H-1*.

Table H-1
City of Monterey Safe Growth Survey Results

Topic Area	2021	2016
Land Use	3.25	3.75
Transportation	2.67	4.67
Environmental Management	3.33	3.67
Public Safety	1.67	4.00
Zoning Ordinance	2.25	4.75
Subdivision Regulations	1.67	3.00
Capital Improvement Program & Infrastructure Policies	2.00	3.33
Building Code	5.00	5.00
Economic Development	2.00	5.00
Average Survey Ratings	2.65	4.13

H.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Monterey's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Monterey is included in this Annex.

The City of Monterey's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**.

Table H-2 displays the results of the hazard risk ranking exercise that was performed by the City of Monterey's Planning Team.

Table H-2
Threat Hazard Identification Risk Assessment (THIRA): City of Monterey

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	-	-	-	-	-	-
Coastal Erosion	2.7	2.9	2.9	2.9	11.4	Substantial
Coastal Flooding	2.9	3.0	3.1	3.1	12.1	High
Cyber-Attack	2.8	2.8	2.9	3.2	11.7	Substantial
Dam Failure	-	-	-	-	-	-
Drought & Water Shortage	3.3	3.1	3.0	3.2	12.6	High
Earthquake	2.9	2.6	3.0	3.4	11.9	Substantial
Epidemic	3.1	2.8	3.0	2.9	11.8	Substantial
Extreme Cold & Freeze	1.4	1.3	1.3	1.5	5.5	Slight
Extreme Heat	2.0	2.0	2.0	1.9	7.9	Possible
Flash Flood	2.0	2.0	2.0	2.3	8.3	Moderate
Hazardous Materials Incident	2.2	2.1	2.0	3.0	9.3	Moderate
Invasive Species	2.7	2.4	2.2	2.3	9.6	Moderate
Levee Failure	-	-	-	-	-	-
Localized Stormwater Flooding	2.4	2.7	2.4	2.4	9.9	Moderate
Mass Migration	1.2	1.2	1.2	1.2	4.8	Slight
Pandemic	3.1	2.9	3.0	3.1	12.1	High
Riverine Flooding	1.7	1.9	1.8	1.5	6.9	Possible
Sea Level Rise	2.7	2.9	3.1	3.4	12.1	High
Severe Winter Storms	2.9	2.8	2.4	2.6	10.7	Substantial
Slope Failure	2.6	2.6	2.6	2.6	10.4	Substantial
Targeted Violence	2.0	2.0	2.9	3.2	10.1	Substantial
Terrorism	2.2	1.9	3.0	3.3	10.4	Substantial
Tsunami	2.3	2.3	3.1	3.1	10.8	Substantial
Utility Interruption/ PSPS	3.1	2.7	2.7	2.7	11.2	Substantial
Water Contamination	3.0	2.3	3.3	3.3	11.9	Substantial
Wildfire	3.1	2.0	3.7	3.8	12.6	High
Windstorms	2.8	2.8	2.6	2.6	10.8	Substantial

H.5.1 AGRICULTURAL EMERGENCIES

There is no agricultural land located within the City, so therefore an agricultural emergency does not pose a direct threat. Since agriculture is a major economic driver in the County, an agricultural emergency could have indirect economic impacts on the City.

H.5.2 COASTAL EROSION

To determine coastal erosion risk, USGS Pacific Coastal and Marine Science Center Coastal Storm Modeling System (CoSMos) shoreline change, and cliff retreat projection data was used. For cliff

retreat modeling an end of century (2100) forced sea level rise amount of 200 cm was used based on Ocean Protection Council (OPC) High Risk Aversion Guidance. For shoreline change, winter erosion uncertainty modeling was used to capture the degree of uncertainty associated with future shoreline erosion. Hold the Line scenario modeling was chosen for both types of erosion. Three sea level rise levels (25 cm, 75 cm, and 200 cm) to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Table H-3 summarizes population and property exposure to coastal erosion risk.

Table H-3
Population and Property Exposed to Coastal Erosion Risk in Monterey

Sea Level Rise Scenario/ Erosion Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Cliff Erosion					
Sea Level Rise (25 cm)	0	0	\$0	0	\$0
Sea Level Rise (75 cm)	0	0	\$0	0	\$0
Sea Level Rise (200 cm)	0	0	\$0	0	\$0
Shoreline Erosion					
Sea Level Rise (25 cm)	0	0	\$0	0	\$0
Sea Level Rise (75 cm)	0	0	\$0	0	\$0
Sea Level Rise (200 cm)	0	0	\$0	0	\$0

Sea level rise and erosion modeling is inherently uncertain, and therefore future modeling could identify people and property at risk to coastal erosion. The City could also be impacted by other types of erosion not profiled in this Plan.

H.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in a mapped dam inundation zone of any of the dams (Nacimiento, San Antonio, Los Padres, and Forest Lake) analyzed in this Plan.

Levee Failure

Based on the Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

H.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution. A prolonged drought

could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Tourism, a major economic driver in the City, will likely be impacted by drought conditions and thereby impact the local economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

H.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 12,204 residential and non-residential buildings in the City, with a total value of \$6,677,984,992. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Earthquake-induced liquefaction risk was also assessed. *Table H-4* summarizes population and property in the City exposed to liquefaction risk. Additionally, approximately 38 miles of roadway in the City is located in an area of high liquefaction risk.

Table H-4
Population and Property Exposed to Liquefaction Risk in Monterey

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	8,647	435	\$317,615,274	925	\$461,245,115
Moderate Liquefaction Susceptibility	588	288	\$233,293,803	88	\$50,222,070

H.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table H-5* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table H-5
Population and Property Exposed to Flooding Risk in Monterey

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	1,357	7	\$7,036,275	296	\$261,933,091
500-Year Flood Zone	1,551	64	\$45,801,646	340	\$186,215,085

H.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook

that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the “protective action distance” is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Department of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table H-6 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table H-6					
Population and Property Exposed to Hazardous Materials Incident Risk in Monterey					
Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	16,773	3,950	\$2,515,586,019	3,924	\$1,892,199,199
Fixed Source	0	0	\$0	0	\$0

H.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

H.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

H.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe

weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts. FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table H-7*.

Table H-7
Annualized Frequency and Exposure to Severe Weather Events in Monterey

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.19	Frequency (<i>Distinct Events</i>)	0.03
Exposed Population	26,380	Exposed Population	26,380
Exposed Building Values	\$4,533,377,000	Exposed Building Values	\$4,533,377,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$583
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	0.08	Frequency (<i>Distinct Events</i>)	0.88
Exposed Population	26,380	Exposed Population	17,941
Exposed Building Values	\$4,533,106,201	Exposed Building Values	\$3,080,433,353
Expected Annual Loss of Building Value	\$2	Expected Annual Loss of Building Value	\$52,899,104
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.45	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	26,380	Exposed Population	0
Exposed Building Values	\$4,533,377,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$715	Expected Annual Loss of Building Value	\$0

Source: FEMA National Risk Index

H.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 4,150 people and \$579,224,935 in building value in the City is exposed to landslide risk. Exposure of population and property in the City to earthquake induced landslides is summarized in *Table H-8*.

Table H-8
Population and Property Susceptible to Earthquake Induced to Landslides in Monterey

Landslide Susceptibility	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High	417	21	\$20,221,418	7	\$0
Moderate	5,532	679	\$498,743,525	576	\$431,060,199

Additionally, approximately 24 miles of road are located in an area of moderate susceptibility to earthquake-induced landslides and about 2 miles of roadway is located in an area of high susceptibility.

H.5.12 TSUNAMI

Population and property in the City located in a mapped tsunami inundation zone is summarized in *Table H-9*. Additionally, 1 communication facility is located in the tsunami inundation zone.

Inundation Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Tsunami Inundation Zone	1,716	268	\$179,727,264	1,372	\$656,228,802

H.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption.

H.5.14 WILDFIRE

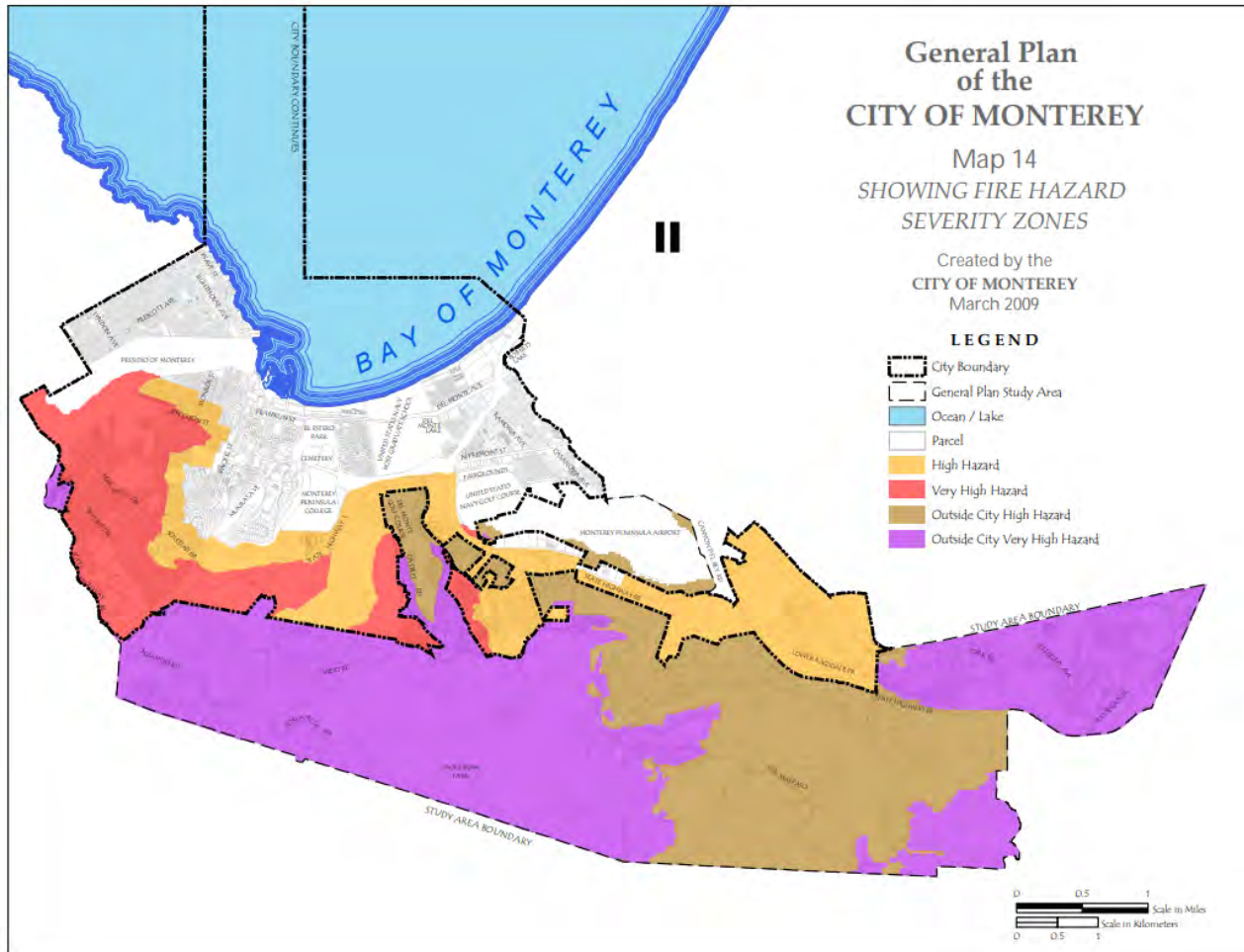
For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate. *Table H-10* summarizes population and property in the City in very high, high, and moderate fire threat areas. No portion of the City was determined to be in an area of extreme fire threat. Additionally, areas of moderate wildfire threat include 4 medical facilities, 19 communication facilities, and 68 miles of roadway. Areas of high fire threat include 1 medical facility, 2 communication facilities and about 7 miles of roadway.

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	3,354	97	\$166,594,741	608	\$243,020,149
Moderate Fire Threat	14,427	1,593	\$1,230,019,857	1438	\$955,872,431

Areas in the City have also been mapped as located in Fire Hazard Severity Zones (FHSZ) by CAL FIRE. These zones are designated Very High or High Fire Hazard Severity based on factors such as fuel, slope, and fire weather. Areas designated as Fire Hazard Severity Zones in the City are mapped in *Figure H-1*. Any future revisions or updates to the FHSZ maps will supersede current mapping. In Monterey, high fire hazard areas can be correlated with areas considered to be wildlands or areas with wildland type vegetation that are generally not intensely developed. High fire hazard areas generally contain forest and chaparral vegetation that is highly flammable, are of moderate to steep slope, and become extremely dry during the summer months. Forested areas are predominant, comprising nearly the entire high fire hazard area. Areas of special concern for wildfire risk include: the area behind the Del

Monte Shopping Center, and the City's greenbelts (Skyline Forest, Veterans Park, Monte Vista, Carmelo Street, Don Dahvee/Iris Canyon, Josselyn Canyon, Fisherman Flats, and the Old Capitol Site).

Figure H-1
Wildfire Severity Zones in Monterey



Source: [City of Monterey General Plan](#)

H.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure. Drought, coastal and inland flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the rural economies, along with changes to agriculture and crops, which are a critical backbone of Monterey County's economic success. There will also be negative impacts to ecosystems, both on land and in the ocean, leading to local extinctions, migrations, and management challenges.

Sea level rise risk exposure in the City was calculated based on the NOAA Office for Coastal Management [sea level rise viewer](#) projections. Three sea level rise levels (25 cm, 75 cm, and 200 cm) were chosen to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk. Population and property exposed to sea level rise risk is summarized in *Table H-11*.

Table H-11
Population and Property Exposed to Sea Level Rise in Monterey

Sea Level Rise Amount	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
1 ft Sea Level Rise (2030)	360	1	231	180	\$171,982,465
3 ft Sea Level Rise (2060)	360	1	231	190	\$239,444,154
7 ft Sea Level Rise (2100)	935	15	\$13,417,594	447	\$370,731,019

The City recently conducted a study of sea level rise impacts: [City of Monterey: Adapting A Threatened Transportation Network to Sea Level Rise](#). *Figure H-2* shows the regions determined to be at risk to sea level rise. The report also found that several critical transportation arterials are at risk to sea level rise. Within a decade portions of Del Monte Avenue may be inundated by floodwaters during a 50-year event. By mid-century, regular tides will flood the Lighthouse Tunnel and reach Pearl Street where it crosses Lake El Estero; and large storm waves could reach as high as Cannery Row at the Monterey Bay Aquarium. By end of century, Fremont Street at Lake El Estero will be underwater.

Figure H-2
Coastal Flood-Prone Regions in Monterey



Source: City of Monterey: Adapting A Threatened Transportation Network to Sea Level Rise

H.6 CAPABILITY ASSESSMENT

The City of Monterey performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table H-12*
- An assessment of administrative and technical capabilities is presented in *Table H-13*
- An assessment of fiscal capabilities is presented in *Table H-14*
- An assessment of education and outreach capabilities is presented in *Table H-15*
- Classifications under various community mitigation programs are presented in *Table H-16*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section H.6.1 in *Table H-17*
- An overall self-assessment of capability is presented in Section H.6.2 in *Table H-18*

Table H-12
Planning and Regulatory Capability

Document	Department	Comments
Planning Documents		
General Plan	☒ • Community Development	
Capital Improvement Plan	☒ • Public Works	
Floodplain Management Plan	☐ • Community Development	
Open Space Management Plan	☒ • Parks and Recreation	Fuel reduction and forest management greatly reduce the likelihood of fire and would lessen intensity in the event of a fire.
Stormwater Management Plan	☒ • Public Works	Storm Water 'Guidance Document' (Phase II Small MS4 SW Permit Coverage Document)
Coastal or Shoreline Management Plan	☒ • Community Development	The City has developed an analysis of sea level rise vulnerability and is currently working on drafting of the LCP update.
Local Coastal Program	☐ • Community Development	In the near future, the City is looking to update the City's Local Coastal Program and receive certification from CCC.
Climate Action/ Adaptation Plan	☒ • Community Development • Sustainability	The City has a Climate Action Plan (CAP) that identifies existing activities that contribute to local climate adaptation and priority steps for adaptation planning. We are looking to update the CAP in the near future.

Table H-12
Planning and Regulatory Capability

Document	Department	Comments
Emergency Operations Plan	☒ • Fire Department	
Continuity of Operations Plan	☒ • Various Departments	
Community Wildfire Protection Plan	☐ • Fire Department	CWPP is planned dependent on funding.
Evacuation Plan	☒ • Fire Department • Police Department • City Manager's Office	Monterey is participating in development of countywide Evacuation Plan.
Disaster Recovery Plan	☒ • Various Departments	
Economic Development Plan	☐ • City Manager's Office	Economic Development efforts continue to be refined. The City has a Historic Master Plan. The City also has multiple neighborhood-focused historic context statements and reconnaissance surveys .
Historic Preservation Plan	☒	
Transportation Plan	☒ • Public Works • Community Development	Update in progress. Move Monterey Plan, Multimodal plan, provides policies for enhanced mobility options
Codes, Ordinances & Requirements		
Floodplain Ordinance	☒ • Public Works • Community Development	City Code, Chapter 9 Building Regulations, Article 7 Flood Damage Prevention
Zoning Ordinance	☒ • Community Development	City of Monterey Code, Chapter 38
Subdivision Ordinance	☒ • Community Development	City of Monterey Code, Chapter 33
Site Plan Review Requirements	☒ • Community Development	The City has checklists for applications that require site plan completeness.
Unified Development Ordinance	☐	
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐	
California Building Code	☒ • Community Development	Monterey adopts and enforces the most recent version of California Building Codes and maintains a fully staffed Building Division.
Fire Prevention Code	☒ • Fire Department	Monterey adopts and enforces most recent version of California Fire Code and maintains a fully staffed Fire Department

Table H-13
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒ - Community Development - Public Works- Engineering	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒ - Community Development - Public Works- Engineering	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒ - Community Development - Public Works- Engineering	
Building Inspector	☒ Community Development	
Emergency Manager	☒ - Fire Department - City Manager's Office	Role is shared collateral duty for Fire Chief and Assistant City Manager.
Floodplain Manager	☒ - Public Works - Community Development	Per City Code, Chapter 9 Article 7, Public Works Director is the designated Floodplain Administrator
Land Surveyors	☒ Public Works-Engineering	
Resource development staff or grant writers	☒ - Community Development - Public Works- Engineering	Planning and transportation related grants
Public Information Officer	☒ City Manager's Office	
Scientist(s) familiar with the hazards of the community	☒ Public Works-Engineering	
Staff with education or expertise to assess the community's vulnerability to hazards	☒ Community Development	
Personnel skilled in Geographic Information Systems (GIS)	☒ Information Resources	Monterey uses ESRI software and works with all City departments
Maintenance programs to reduce risk	☒ - Public Works - Parks and Recreation	Monterey has programs in place to maintain all city-owned infrastructure.
Warning systems/services	☒ - Fire Department - Police Department - City Manager's Office	Monterey uses the County Everbridge notification system as well as Nixle.
Mutual Aid Agreements	☒ Fire Department	Monterey participates in the Monterey County Fire Mutual Aid Plan as well as the California Fire Assistance Agreement.

Table H-14
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	• Finance	
Capital Improvements Project Funding	☒	• Public Works-Engineering	
Special Purpose Taxes	☒	• Public Works-Engineering • Finance	Measure X Transportation Tax Measure (TAMC), Measure S for Roads, Storm Drains, Sewer (Public Works)
Stormwater Utility Fees	☒	• Public Works-Engineering	Monterey Code, Chapter 31.5 Article 1
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☐		
Development Impact Fees	☐		
General Obligation Bonds	☐		
Special Tax and Revenue Bonds	☒	• Finance	Measure G Sales Tax (2020), Measure Y 2% Transient Occupancy Tax (TOT) increase (2020) increase to 12%
Community Development Block Grants (CDBG)	☒	• Community Development	The City of Monterey is a direct recipient of CDBG funding

Table H-15
Education and Outreach Capability

Educational and Outreach Resources		Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒	• Public Works-Engineering	Monterey Regional Storm Water Management Program (Environ. Protection)- Regularly coordinate with the California Marine Sanctuary Foundation, Save The Whales, Ecology Action, and others.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒	• Public Works-Engineering • City Manager's Office	Monterey Regional Storm Water Management Program (Environ. Education)- Monthly public meetings, robust regional public education/ outreach program. City website, Mornings with the Manager, Local Update Community Emails, City Focus, News Releases, etc.

Table H-15
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Natural disaster or safety related school programs	☐	
Public-private partnership initiatives addressing disaster-related issues	☐	

Table H-16
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	Yes	2	6/17/2015
StormReady Certification	Yes	-	
TsunamiReady Certification	Yes	-	
Firewise Communities Certification	No	-	-

Political Capability

The Monterey City Council is supportive of hazard mitigation and long-term risk reduction projects. The City Council's mission is: "In partnership with our entire community, the Monterey City Council provides visionary leadership ensuring a safe, healthy, historic, economically vibrant, and sustainable environment." Hazard mitigation efforts support a safe and healthy environment in the City of Monterey.

H.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table H-17
National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Lori L Williamson, Chief Building Official
NFIP Community Number:	060200
Flood Insurance Policies in Force:	58
Insurance Coverage in Force:	\$19,847,400
Written Premium in Force:	\$49,129
Total Loss Claims:	37
Total Payments for Losses:	\$2,654,717
Adopted Regulations that meet NFIP Requirements:	
• City Code, Chapter 9 Building Regulations, Article 7 Flood Damage Prevention (Ordinance 3293; 06/2001)	
Date of last NFIP Community Assistance Visit (CAV):	
The City has a fairly new team that has been there for approximately 2 years. There has not been a CAV or CAC during that time.	
Higher standards that exceed minimum NFIP requirement:	

Table H-17
National Flood Insurance Program (NFIP) Compliance

City of Monterey standards meet NFIP minimum requirements.

Additional floodplain management provisions:

City of Monterey General Plan, Safety Element, includes the goals and policies under the topics of Flood Hazards and Emergency Preparedness related to flooding. Furthermore, [Figure 13](#) of the General Plan shows Flood Zones. Some of the newer plans include flooding: [Waterfront Master Plan](#) (Goal C and Project C.4.d are related to flooding); See other Commercial, Neighborhood Plans, and Coastal Plans [here](#). Additionally, the City of Monterey adopted a study titled, Adapting a Threatened Transportation Network to Sea Level Rise. See report and other details [here](#).

Floodplain management activities performed that go beyond FEMA minimum requirements:

None identified.

Existing impediments to running an effective NFIP program:

The City has not encountered any impediments to running an effective NFIP program.

Specific actions that are ongoing or considered related to continued compliance with the NFIP:

- Maintain digital FEMA elevation certificates for all construction in the floodplain.
- Evaluate current floodplain management activities and coordinate with Insurance Services Office, Inc. to apply for participation in FEMA's Community Rating System (CRS).
- Establish a goal to have each plan reviewer and building inspector attend a related training periodically.
- Encourage or require certain local staff positions to obtain and maintain Certified Floodplain Manager (CFM) certification.
- Maintain supplies of FEMA/NFIP materials to help property owners evaluate measures to reduce potential hazard damage. Make information available in public buildings, local library, website, etc. and inform people who they can call to learn more information.

H.6.2 SELF-ASSESSMENT OF CAPABILITY

Table H-18
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	High
Administrative and Technical Capability	High
Fiscal Capability	High
Education and Outreach Capability	High
Political Capability	High
Overall Capability	High

H.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions

- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

H.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.
- **Adapting A Threatened Transportation Network to Sea Level Rise:** Includes the principles of hazard mitigation to address sea level rise risk.
- **Climate Action Plan:** Highlights potential programs that could be implemented to reduce greenhouse gas emissions and discusses possible impacts of climate change.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and

expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

H.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Monterey Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Monterey are identified below:

- The Monterey Tides Resort, the Del Monte Beach Condos, the La Playa Townhomes, and the Monterey Harbor are located in an area threatened by wave attack, coastal erosion, and coastal flooding. In particular the existing dock structures in the Harbor are highly vulnerable to future damages. Additionally, all waterfront businesses along Cannery Row are vulnerable to high wave action.

- The Lighthouse Avenue tunnel has the potential to flood during heavy rainfall events despite having an extensive pumping, diversion, and collection system for stormwater drainage. Project funding is required to make the necessary upgrades and alleviate the need for sandbagging, etc.
- The Monterey Interceptor pipeline, which transports all of the untreated sewage from the City of Monterey and Pacific Grove to Monterey One Water's Regional Treatment Plant in Marina, is a critical facility deemed at risk to the long-term effects of coastal erosion and sea level rise, particularly between the Seaside Pump Station and Monterey Tides Resort.
- In Monterey, several critical arteries are at risk to coastal flooding and sea level rise. Within a decade portions of Del Monte Avenue may be inundated by floodwaters during a 50-year event, requiring more adequate storm drainage capacity through future capital improvements/upgrades to existing systems. permanently. By mid-century, regular tides will flood the Lighthouse Tunnel and reach Pearl Street where it crosses Lake El Estero; and large storm waves could reach as high as Cannery Row at the Monterey Bay Aquarium. By the end of the century, Fremont Avenue at Lake El Estero will be underwater.
- Despite ongoing hazard mitigation projects, policies, and activities, the City remains very concerned about the high threat of wildland fire due to existing terrain, fuels, etc. in combination with large areas of urban/wildland interface and intermix. Areas of special concern include: the area behind the Del Monte Shopping Center, and the City's greenbelts (Skyline Forest, Veterans Park, Monte Vista, Carmelo Street, Don Dahvee/ Iris Canyon, Josselyn Canyon, Fisherman Flats, and the Old Capitol Site). The City continues to address these areas through fuel management practices to the extent that available funds allow.
- The World Economic Forum's [Global Risks Report 2021](#) has ranked cyber threats among the leading global risks. Cyber-attacks, primarily social engineering and ransomware are the fastest-growing cybercrime. The blurring line between digital and physical domains indicates the City will only be secure if we incorporate cybersecurity features, principles, training, and frameworks that span across all systems to protect against attackers that are silent, distributed, varied, and technically savvy.
- The City is vulnerable to significant tsunami run-up and strong currents following earthquake events.
- Several military facilities, which are important national defense assets, are located in the City of Monterey, including the US Army Garrison Presidio of Monterey (home to the Defense Language Institute), US Coast Guard Station Monterey, Naval Support Activity Monterey [(home to the Naval Postgraduate School (NPS), Navy Research Lab (NRL), and the Fleet Numerical Meteorology and Oceanography Center (FNMOC). NPS is the largest producer of advanced graduate degrees for the Department of Defense and has thousands of annual graduates from all services and over 50 countries. These key military installations are all vulnerable to terrorist attacks.

H.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Monterey Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table H-20* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table H-19* includes the status of actions completed or removed from the previous plan. In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table H-19
City of Monterey Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
1	Develop community Citizen Corps programs that also include a mitigation component. (New radio system, improvement in neighborhood CERT supplies, continued training)	Completed	The City implemented a new radio system, improved neighborhood CERT supplies, and has continued training.
5	Complete TsunamiReady program	Completed	The City has been certified TsunamiReady.
6	Study and research possible Tsunami warning/alerting system (giant voice, sirens)	Completed	The City considered options for alerting as part of its TsunamiReady certification.
7	Participate in Fire Safe Council Monterey County.	Complete/Continuous	The City participates in the Fire Safe Council Monterey County and will continue to do so.

Table H-20
City of Monterey Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing/ Continuous	Wildfire	Continue to conduct current fuel management programs and investigate and apply new and emerging fuel management techniques. (Fuel reduction programs for green belt and park areas)	Priority / High	Parks & Recreation	General Fund, Grant Funding
2	Ongoing/ Continuous	Wildfire	Provide information to neighborhoods about the need for defensible space and enforcement of defensible space regulations through prevention division on identified parcels.	Moderate	Fire	USFA, PDM and HGMP grants
3	Ongoing/ Continuous	Tsunami	Maintain TsunamiReady program certification.	Moderate	Public Works, Fire	General Fund
4	New/ 2-5 years	Wildfire	Develop a Community Wildfire Protection Plan in coordination with neighboring Jurisdictions.	Moderate	Fire	General Fund
5	In Progress/ 2-5 years	Earthquake, Tsunami, Flooding, Sea Level Rise	Develop an inventory of public, commercial, and private buildings, as well as maritime facilities and infrastructure, which may be vulnerable or at risk to earthquake damage, tsunami inundation and currents, stormwater flooding, and sea level rise. Additionally, collect, create, or update maps and /or data that depict historic and potential damage from the hazards listed above.	Moderate	Public Works	General Fund
6	In Progress/ 5 years	Climate Change	Prepare a climate adaptation plan.	Low	Community Development	General Fund
7	Ongoing/ Continuous	Human- Caused	Cyber Response Strategy Update - Use a comprehensive and layered cybersecurity strategy to reduce the risk associated with the growing remote workforce and cloud-hosted solutions.	Priority / High	Information Resources	General Fund
8	New/ 2-5 years	Human- Caused	Identify potential likely targets for terrorism threats and work with allied agencies to develop a coordinated response plan.	Moderate	Police Department	General Fund
9	New	Drought	Provide public information on water conservation and champion regional and local efforts to secure adequate, affordable, and sustainable water sources for the city, now and into the future.	Moderate	City Management	General Fund

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ANNEX I: PACIFIC GROVE



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



I. CITY OF PACIFIC GROVE

I.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

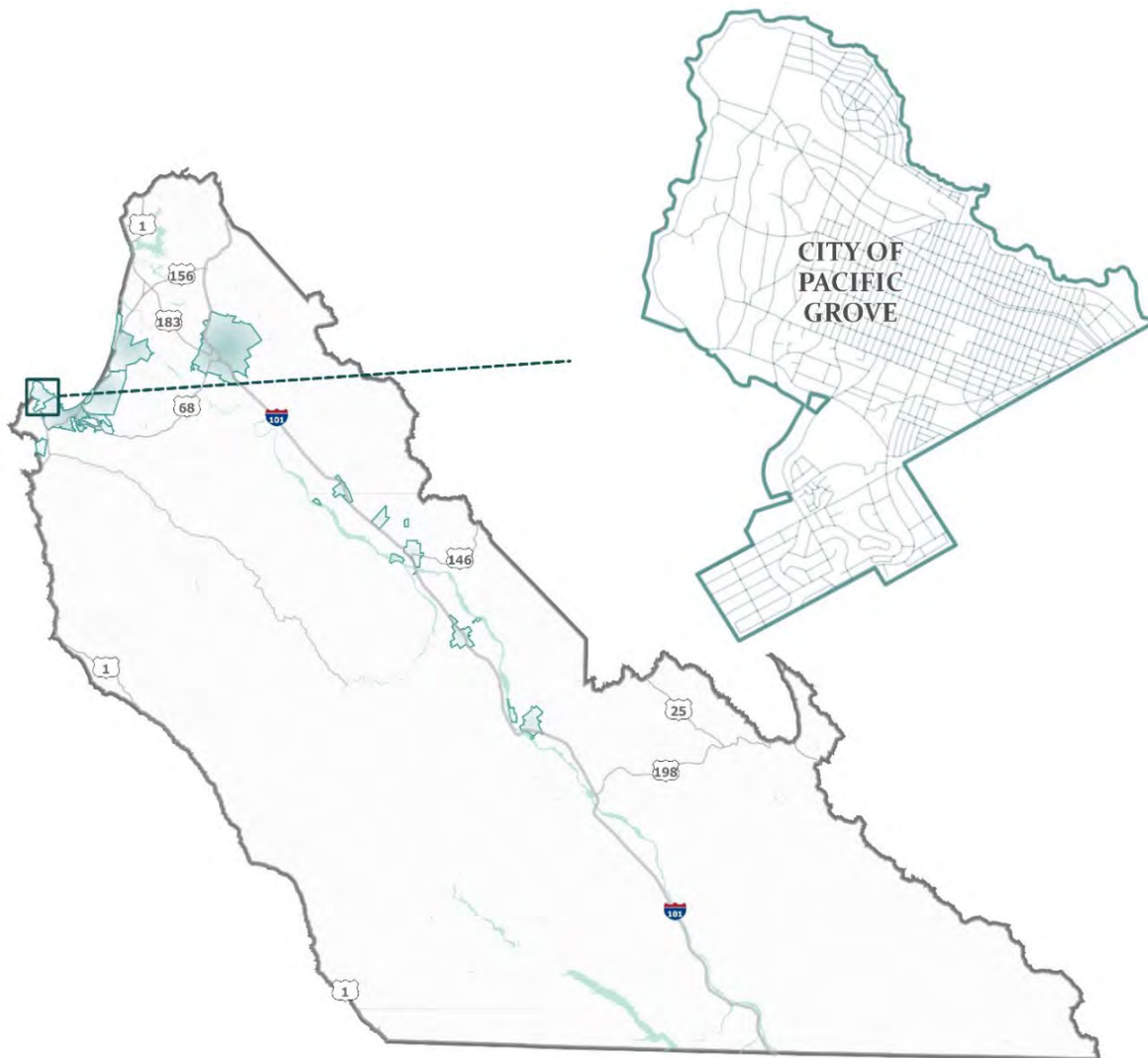
Alyson Hunter, ACIP
Community Development Dept. Director
300 Forest Ave., 2nd Floor
Pacific Grove, CA 93950
(831) 648-3127
ahunter@cityofpacificgrove.org

Alternate Point of Contact

Daniel Gho
Public Works Director
2100 Sunset Drive
Pacific Grove, CA 93950
(831) 648-5722 x4203

I.2 COMMUNITY PROFILE

I.2.1 LOCATION



I.2.2 GEOGRAPHY AND CLIMATE

Pacific Grove is a small coastal city at the tip of the Monterey Peninsula, northwest of the City of Monterey, known for its beautiful scenery and unique architecture including many Victorian-style homes. The City borders the Monterey Bay, the City of Monterey, the Pacific Ocean, the Del Monte Forest, Pebble Beach, and the Army Presidio of Monterey. Pacific Grove enjoys a Mediterranean-like climate that is characterized by a winter rainy season and cool dry summers. Annual precipitation is approximately 20 inches per year.

I.2.3 HISTORY

Pacific Grove was founded in 1875 when David Jacks donated 100 acres of land to the Methodist Episcopal Church to establish a "Christian Seaside Resort." Through dubious means, Jacks, had acquired title to over 7,000 acres of land in this area--virtually the entire Peninsula. He loaned \$30,000 to the Pacific Grove Retreat Association, which had formed during that first year, to lay out streets and make other improvements. In the early 1880s Jacks sold the Pacific Grove property and some adjoining land, to The Pacific Improvement Company, manned by the "Big Four," Crocker, Hopkins, Stanford, and Huntington, (the parent company of Del Monte Properties Company, now The Pebble Beach Company). The Retreat officials were concerned that they might lose strict moral control of the new community, but Jacks had protected them in the terms of the sale. They could still ban cards, dice, billiards, dancing, liquor, and on Sundays, swimming, and the sale of anything except medicine. The Retreat surrounded itself with a fence on three sides and kept its gate padlocked, separating itself from "disdainful" Monterey. For 10 years Pacific Grove maintained its character as a camp meeting ground occupied in summer.

When the Pacific Improvement Company opened the lavish Hotel Del Monte in 1880, floods of tourists arrived. When the hotel burned in 1887, the company started to rebuild immediately, but in the meanwhile constructed the El Carmelo Hotel in Pacific Grove on Lighthouse between Grand and Fountain Avenues. Many visitors returned to the town and built homes on the tiny lots, intended for tents, many of which still stand shoulder to shoulder. Two-story Victorian mansions began to appear. Today over 500 homes have been approved by the Pacific Grove Heritage Society to wear green plaques showing the year they were built and their original owner.

The Pacific Improvement Company contributed \$10,000 toward the construction of a new \$25,000 church and allowed the community to share its water supply from the Carmel River. In 1889, the Southern Pacific Railroad extended service to the town. In the 1880s, Benjamin Langford, a state senator who had property in the town, became fed up with coming in the pedestrian gate and walking a mile to the retreat office for the gate key in order for a carriage to pass and opened the gate with an axe. Soon afterward the entire town fence came down. Among the organizations to choose the Pacific Grove Retreat for meetings were the Chautauqua movement, the YWCA, a Farmer's Institute, and a School of Music among others. The Asilomar Conference Grounds, now owned by the State, was originally a YWCA retreat. In 1889, with 1300 permanent residents and an area of one square mile, Pacific Grove was incorporated as a City. By 1910, three separate additions were made to the City.

I.2.4 POPULATION

The City of Pacific Grove has a population of 15,090 people, a marginal increase (0.3%) since 2010.

I.2.5 GOVERNING BODY FORMAT

Pacific Grove is a Charter city. The City Council consists of an elected Mayor holding a two-year term and six Council Members elected at large for four-year staggered terms. The City Council appoints the City Manager who is the administrative head of the municipal government.

I.2.6 ECONOMY AND TAX BASE

The economy of this primarily residential community is based on tourism and local services, many of which are available in its historic downtown. The City is home to Asilomar State Beach, a narrow 1-mile stretch of sandy beach and rocky coves which provides public access to the shoreline and includes Asilomar Conference Grounds, a National Historic Landmark.

I.3 PLANNING PROCESS

The City of Pacific Grove followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process. The City of Pacific Grove held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on May 5, 2021. Key stakeholders present at the meeting included:

- Alyson Hunter, Senior Planner
- Anastazia Aziz, Director Community Development
- Commander Dave Santos, Pacific Grove Police Department
- Mohammed Khasimi, IT Director
- Daniel Gho, Public Works Director

I.4 LAND USE AND DEVELOPMENT

The Pacific Grove General Plan was adopted in 1994. The City of Pacific Grove's land use pattern is well established. The City's total area is approximately 1,830 acres, excluding that portion of the City that extends into Monterey Bay and Pacific Ocean. The predominant land use in the City of Pacific Grove is residential (46%), and most of the residences are single-family dwellings. Commercial/Professional land uses account for approximately 5% of the land in the City. A small portion of the City along its south border is planned and zoned for industrial use. The City limits include a significant amount of land devoted to parks and natural areas (19%), including Pacific Grove Golf Course, Asilomar State Beach, and George Washington Park. 99% of the City's coastline allows for public access. No significant agricultural areas exist in, or adjacent to, the City.

Pacific Grove is almost fully built out, with very little buildable vacant land remaining in the city. The land use issues in Pacific Grove, therefore, focus primarily on managing existing uses and infill, and potential intensification. The City prohibits new housing development on the seaward side of oceanfront streets, protecting unobstructed access and views for the public at large. The City's coastal zone is 458 acres. The coastal zone includes numerous land use types, including residential and commercial development near its downtown core, as well as restored dune habitat located within Asilomar State Beach and to the north within the City's limits. Pacific Grove's Local Coastal Program

Land Use Plan was first certified by the Coastal Commission in 1988. At the time, the second component of the LCP, the Implementation Plan, was never certified. In 2014, with grant funding from the Coastal Commission, Pacific Grove began an update of their LCP. The updated LCP was adopted by City Council on January 15, 2020 and certified by the Commission on March 11, 2020.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**. The Pacific Grove Safe Growth Survey was completed by Alyson Hunter, Senior Planner at the time of completion, and current Community Development Department Director for the City of Pacific Grove. The results are summarized in *Table I-1*.

Table I-1
City of Pacific Grove Safe Growth Survey Results

Topic Area	2021	2016
Land Use	2.50	2.50
Transportation	1.67	2.33
Environmental Management	3.00	4.00
Public Safety	2.33	3.33
Zoning Ordinance	4.00	2.50
Subdivision Regulations	2.67	2.33
Capital Improvement Program & Infrastructure Policies	2.00	2.67
Building Code	4.00	5.00
Economic Development	2.00	2.00
Average Survey Ratings	2.69	2.96

I.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Pacific Grove's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Pacific Grove is included in this Annex.

CITY OF PACIFIC GROVE Multi-Jurisdictional Hazard Mitigation Plan

The City of Pacific Grove’s Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City’s Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table I-2* displays the results of the hazard risk ranking exercise that was performed by the City of Pacific Grove’s Planning Team.

Table I-2
Threat Hazard Identification Risk Assessment (THIRA): City of Pacific Grove

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	-	-	-	-	-	-
Coastal Erosion	3.3	3.7	3.0	4.0	14.0	High
Coastal Flooding	3.0	3.0	3.0	3.7	12.7	High
Cyber-Attack	3.3	3.7	3.0	3.5	13.5	High
Dam Failure	-	-	-	-	-	-
Drought & Water Shortage	4.0	4.0	3.5	4.0	15.5	Very High
Earthquake	2.7	3.7	2.7	3.0	12.0	Substantial
Epidemic	4.0	4.0	3.0	4.0	15.0	Very High
Extreme Cold & Freeze	2.0	2.0	2.0	2.5	8.5	Moderate
Extreme Heat	2.0	1.0	2.0	2.0	7.0	Possible
Flash Flood	1.0	2.0	2.0	2.0	7.0	Possible
Hazardous Materials Incident	2.5	2.0	2.5	3.3	10.3	Substantial
Invasive Species	2.5	2.5	3.0	3.0	11.0	Substantial
Levee Failure	-	-	-	-	-	-
Localized Stormwater Flooding	2.3	2.7	2.3	3.0	10.3	Substantial
Mass Migration	2.0	2.0	2.0	2.0	8.0	Possible
Pandemic	4.0	4.0	3.5	4.0	15.5	Very High
Riverine Flooding	2.0	2.0	2.0	2.5	8.5	Moderate
Sea Level Rise	3.0	3.5	3.0	4.0	13.5	High
Severe Winter Storms	3.3	3.3	3.0	3.7	13.3	High
Slope Failure	2.0	3.0	3.0	3.0	11.0	Substantial
Targeted Violence	2.0	2.5	2.5	2.7	9.7	Moderate
Terrorism	2.5	1.5	3.5	3.3	10.8	Substantial
Tsunami	3.5	2.0	3.5	3.3	12.3	High
Utility Interruption/ PSPS	3.5	3.5	3.0	3.3	13.3	High
Water Contamination	3.0	3.3	3.3	4.0	13.7	High
Wildfire	3.5	1.5	4.0	3.3	12.3	High
Windstorms	3.0	3.0	2.5	3.3	11.8	Substantial

I.5.1 AGRICULTURAL EMERGENCIES

There is no agricultural land located within the City, so therefore an agricultural emergency does not pose a direct threat. Since agriculture is a major economic driver in the County, an agricultural emergency could have indirect economic impacts on the City.

I.5.2 COASTAL EROSION

To determine coastal erosion risk, USGS Pacific Coastal and Marine Science Center (Coastal Storm Modeling System) CoSMos shoreline change, and cliff retreat projection data was used. For cliff retreat modeling an end of century (2100) forced sea level rise amount of 200 cm was used based on Ocean Protection Council (OPC) High Risk Aversion Guidance. For shoreline change, winter erosion uncertainty modeling was used to capture the degree of uncertainty associated with future shoreline erosion. Hold the Line scenario modeling was chosen for both types of erosion. Three sea level rise levels (25 cm, 75 cm, and 200 cm) to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Table I-3 summarizes population and property exposure to coastal erosion risk.

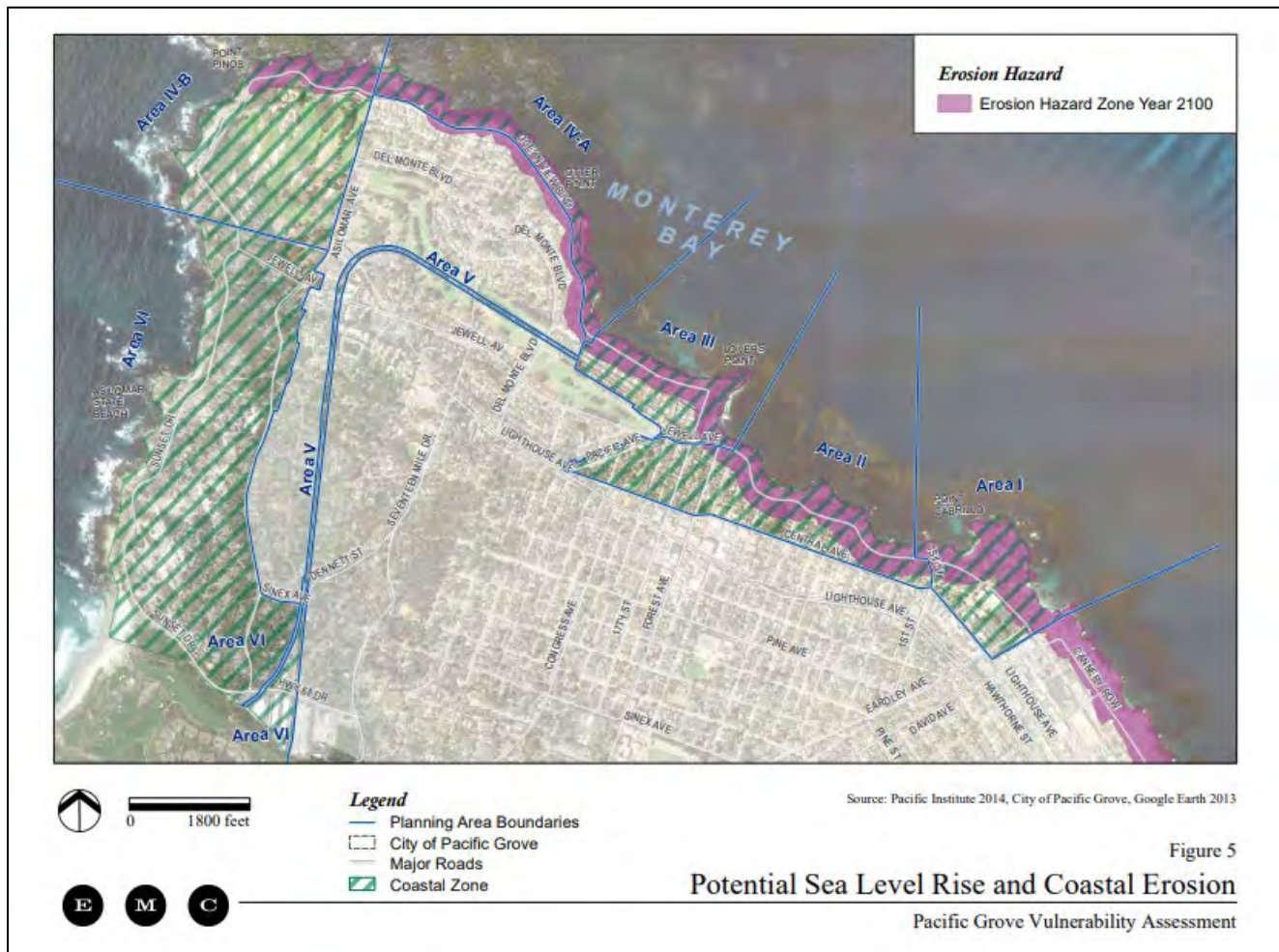
Table I-3 Population and Property Exposed to Coastal Erosion Risk in Pacific Grove					
Sea Level Rise Scenario/ Erosion Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Cliff Erosion					
Sea Level Rise (25 cm)	84	3	\$17,342,399	42	\$9,083,758
Sea Level Rise (75 cm)	138	3	\$17,342,399	44	\$10,632,164
Sea Level Rise (200 cm)	252	16	\$33,183,479	58	\$26,607,577
Shoreline Erosion					
Sea Level Rise (25 cm)	0	0	\$0	0	\$0
Sea Level Rise (75 cm)	0	0	\$0	0	\$0
Sea Level Rise (200 cm)	0	0	\$0	0	\$0

Pacific Grove's shoreline is mostly dominated by exposed granitic rock that forms a relatively stable and durable barrier to protect shoreline development from the constant barrage of ocean waves. Although wave activity can become intense during winter storms, the Pacific Grove shore has historically not retreated significantly. Sea level rise is expected to increase the susceptibility of Pacific Grove's coastline to erosion, as higher sea levels will expose larger areas of the coast to more persistent erosional forces.

The City's 2015 [Climate Change Vulnerability Assessment](#), 2018 [Shoreline Vulnerability Assessment](#), and [2020 Shoreline Management Plan](#) identified a number of areas subject to erosion risk. Areas at risk to coastal erosion combined with sea level rise within Pacific Grove are shown in *Figure I-1*. The greatest increase in coastal erosion is expected to occur along the coastline along the Monterey Bay side of the Peninsula (Areas I through IV-B, in the map below). The main land use affected by coastal erosion in these areas will be residential. Other land uses expected to be affected include public parks

and trails (including Lovers Point), Hopkins Marine Station, Pacific Grove Golf Course, and commercial businesses along Ocean View Boulevard. In addition, the Monterey Interceptor pipeline, which transports all of the untreated sewage from the City to the Monterey One Water Regional Treatment Plant in Marina, is a critical facility deemed at risk to the long-term effects of coastal erosion and sea level rise.

Figure I-1
Coastal Erosion Hazard in Pacific Grove



Source: City of Pacific Grove [Climate Change Vulnerability Assessment](#) (2015)

I.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in a mapped dam inundation zone of any of the dams (Nacimiento, San Antonio, Los Padres, and Forest Lake) analyzed in this Plan.

Levee Failure

Based on the Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

I.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, and relatively affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution. Water is already very expensive in the City, and therefore even small increases in prices could have a large effect on the population. Additionally, drought is likely to increase wildfire risk.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

I.5.5 EARTHQUAKE

Although there are no mapped faults within the City, there are areas of liquefaction and erosion hazards. The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 6,561 residential and non-residential buildings in the City, with a total value of \$3,986,813,668. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table I-4* summarizes population and property in the City exposed to liquefaction risk.

Table I-4
Population and Property Exposed to Liquefaction Risk in Pacific Grove

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	2,622	180	\$195,836,698	154	\$46,356,506
Moderate Liquefaction Susceptibility	0	0	\$0	0	\$0

I.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table I-5* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table I-5
Population and Property Exposed to Flooding Risk in Pacific Grove

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	0	2	\$10,524,893	36	\$8,899,047
500-Year Flood Zone	0	0	\$0	0	\$0

The Hopkins Marine Station is located within an area that is prone to coastal flooding. Transportation routes in the City could be impacted by flooding. Much of Ocean View Boulevard/Sunset Drive between Esplanade Street and Asilomar Avenue is subject to coastal flooding. Although located outside of Pacific Grove, one especially critical transportation link that could be prone to flooding is the Del Monte Boulevard tunnel in Monterey, which provides one of two major access routes into the City.

I.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

There is no population or property in the City, based on the buffer distances that is exposed to a mobile or fixed hazardous materials incident.

I.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

I.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most

vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

1.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to occur anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, and people with life-threatening illnesses. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City will likely be exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts.

FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table I-6*.

Table I-6
Annualized Frequency and Exposure to Severe Weather Events in Pacific Grove

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.19	Frequency (<i>Distinct Events</i>)	0.03
Exposed Population	15,050	Exposed Population	15,050
Exposed Building Values	\$2,193,292,000	Exposed Building Values	\$2,193,292,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$708
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	0.08	Frequency (<i>Distinct Events</i>)	0.88
Exposed Population	15,050	Exposed Population	13,648
Exposed Building Values	\$2,193,291,997	Exposed Building Values	\$1,985,240,194
Expected Annual Loss of Building Value	\$1	Expected Annual Loss of Building Value	\$34,301,461
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.50	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	15,050	Exposed Population	0
Exposed Building Values	\$2,193,292,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$482	Expected Annual Loss of Building Value	\$0

Source: FEMA National Risk Index

The main risk associated with severe weather in Pacific Grove is coastal storm flooding and wave run-up. Increases in the occurrence and intensity of severe storm events is a direct impact of climate change that has the potential to expose development and infrastructure to severe damage. This is of significant concern in Pacific Grove because, combined with sea level rise, intense storms pose one of the most significant climate change threats to the City.

I.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 2,370 people and \$385,194,695 in property value in the City is exposed to landslide risk. The City is not susceptible earthquake induced to landslides.

I.5.12 TSUNAMI

Population and property in the City located in a mapped tsunami inundation zone is summarized in *Table I-7*.

Table I-7 Population and Property in Tsunami Inundation Zone in Pacific Grove					
Inundation Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Tsunami Inundation Zone	421	84	\$168,639,771	69	\$43,593,616

In Pacific Grove, a major concern is the impact a tsunami could have on utilities. A tsunami could impact the water lines along Ocean View Boulevard and wastewater infrastructure. Seven of the City's wastewater pump stations could be inundated by coastal flooding. If flooding causes the pumps to fail, the wastewater system would backup behind the pump station, with potentially serious health consequences, e.g., possible illicit discharges caused by overflows. In an extreme situation, a tsunami could damage a pump station and result in spillage of wastewater, which would have citywide impacts.

I.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City are exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that are operated by electricity are exposed and vulnerable to utility interruption. Widespread power outages are a concern for the City following major winter storms, mostly caused by downed trees.

I.5.14 WILDFIRE

For the purpose of this analysis, CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create four threat classes, extreme, very high, high, and moderate. No portion of the City was determined to be in an area of extreme fire threat.

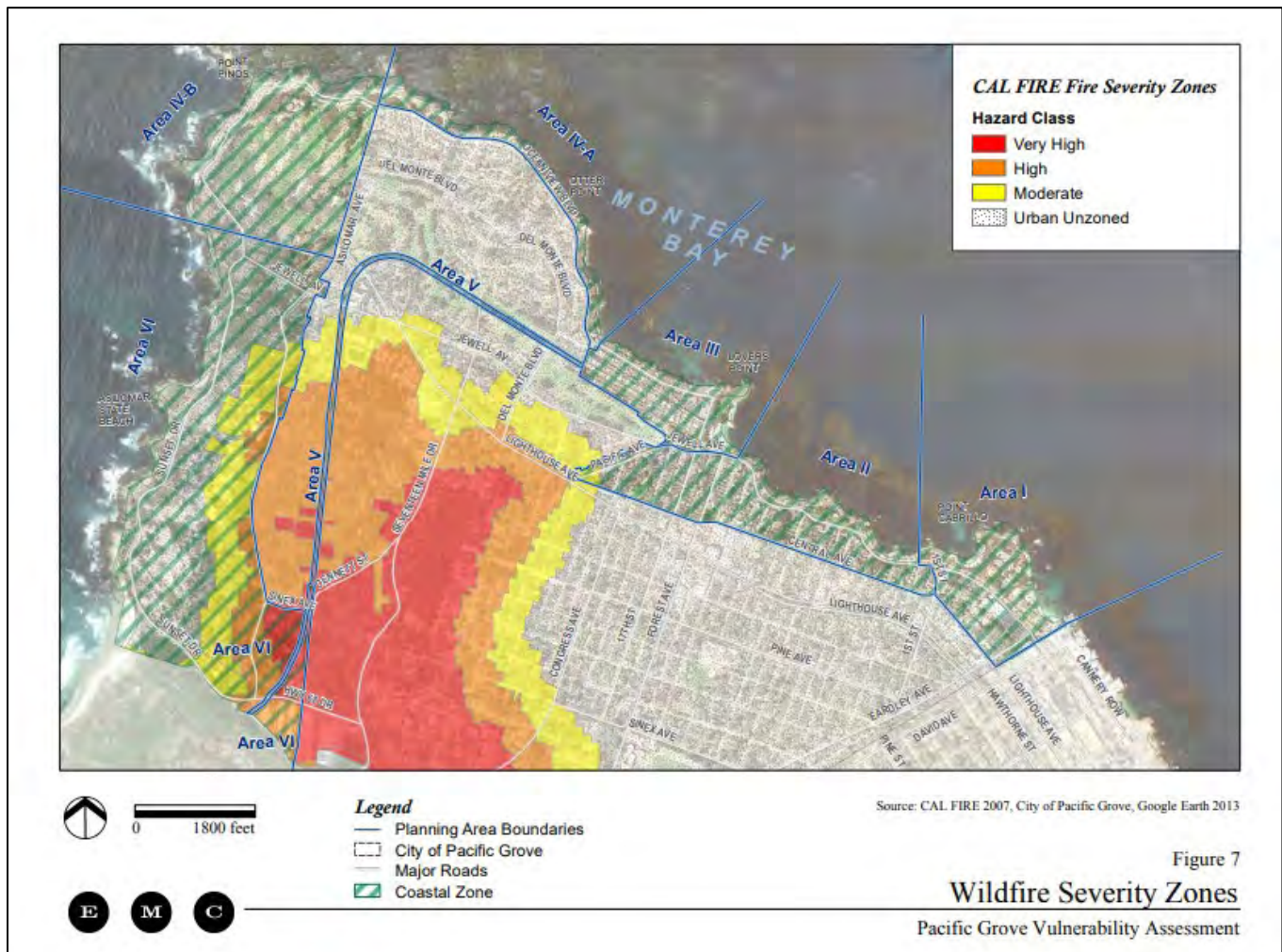
Table I-8 summarizes population and property in the City in very high, high, and moderate fire threat areas.

Table I-8
Population and Property Exposed to Wildfire Risk in Pacific Grove

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	84	21	\$48,540,893	12	\$15,975,413
Moderate Fire Threat	7,145	1,026	\$799,624,068	350	\$110,840,221

Some areas in the City are also designated as Very High Fire Hazard Severity Zones (VHFHSZ) by CAL FIRE, as mapped in *Figure I-2*. In Pacific Grove, areas with the highest risk of wildfire are located in the inland central portion of the City where neighborhoods are more forested and contain a higher density of mature trees. Risk of wildfire decreases as distance from the more forested central area of the City increases.

Figure I-2
Wildfire Severity Zones in Pacific Grove



Source: City of Pacific Grove [Climate Change Vulnerability Assessment](#) (2015)

I.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure.

Drought, coastal and inland flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the rural economies, along with changes to agriculture and crops, which are a critical backbone of Monterey County's economic success. There will also be negative impacts to ecosystems, both on land and in the ocean, leading to local extinctions, migrations, and management challenges.

Sea level rise risk exposure in the City was calculated based on the NOAA Office for Coastal Management [sea level rise viewer](#) projections. Three sea level rise levels (25 cm, 75 cm, and 200 cm) were chosen to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Population and property exposed to sea level rise risk is summarized in *Table I-9*.

Table I-9
Population and Property Exposed to Sea Level Rise in Pacific Grove

Sea Level Rise Amount	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
1 ft Sea Level Rise (2030)	0	1	\$9,505,821	32	\$8,899,047
3 ft Sea Level Rise (2060)	0	1	\$9,505,821	35	\$38,894,623
7 ft Sea Level Rise (2100)	0	2	\$10,524,893	37	\$38,894,623

The City's 2015 [Climate Change Vulnerability Assessment](#), 2018 [Shoreline Vulnerability Assessment](#), and [2020 Shoreline Management Plan](#) identified areas vulnerable to sea level rise risk. *Figure I-3* identifies the potential extent of flooding due to sea level rise combined with a 100-year flood event.

The greatest increase in coastal flooding is expected to occur near Point Pinos and Otter Point, with notable increases at Lovers Point. No structures located within the mapped hazard areas that would experience inundation from sea level rise alone. Two factors account for this: first, the base elevation of developed areas in Pacific Grove is sufficiently high, due to the bluffs along the shoreline; secondly, relatively few structures are located immediately adjacent to the shoreline. However, when the effects of sea level rise and coastal flooding from storms are combined, about 75 houses in the Otter Point area would be subject to flooding. In the Lovers Point area, land uses affected would be mostly Lovers Point Park and nearby commercial businesses. Near Asilomar State Beach, development density is low and coastal flooding would have minimal effect on development.

Infrastructure including roads and water infrastructure could be impacted by sea level rise. Of major concern is the City's significant wastewater infrastructure potentially at risk under combined sea level

rise and coastal storm flooding. Seven of the City's wastewater pump stations could be inundated by coastal flooding. If flooding causes the pumps to fail, the wastewater system would backup behind the pump station, with potentially serious health consequences. In an extreme situation, storm surges could damage a pump station and result in spillage of wastewater.

Figure I-3
Potential Sea Level Rise and Flooding in Pacific Grove



Source: City of Pacific Grove [Climate Change Vulnerability Assessment](#) (2015)

I.6 CAPABILITY ASSESSMENT

The City of Pacific Grove performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table I-10*
- An assessment of administrative and technical capabilities is presented in *Table I-11*
- An assessment of fiscal capabilities is presented in *Table I-12*

CITY OF PACIFIC GROVE Multi-Jurisdictional Hazard Mitigation Plan

- An assessment of education and outreach capabilities is presented in *Table 1-13*
- Classifications under various community mitigation programs are presented in *Table 1-14*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section I.6.1 in *Table I-15*
- An overall self-assessment of capability is presented in Section I.6.2 in *Table I-16*

Table I-10
Planning and Regulatory Capability

Document		Department	Comments
Planning Documents			
General Plan	☒	• Community Development	Includes Safety Element
Capital Improvement Plan	☒	• Public Works	Approved Annually through the budget process
Floodplain Management Plan	☒	• Public Works • Community Development	
Open Space Management Plan	☒	• Public Works	Parks & Rec and Natural Resources Elements in the General Plan
Stormwater Management Plan	☒	• Public Works	Storm Water Permit and Regional Effort
Shoreline Management Plan	☒	• Public Works	
Local Coastal Program	☒	• Community Development	Certified March 11, 2020
Climate Action/ Adaptation Plan	☒	• Community Development • Public Works	Shoreline Management Plan and LCP
Emergency Operations Plan	☒	• City Manager • Fire Department • Police Department	
Continuity of Operations Plan	☐	• Police Department	There is interest in preparing one Effort underway to get this plan developed, no timeline as of yet
Community Wildfire Protection Plan (CWPP)	☐	• Fire Department	
Evacuation Plan	☐	• Fire Department • Police Department	
Disaster Recovery Plan	☐	• IT	The City is working on a disaster recovery policy for continuation of tech infrastructure systems following a disaster
Economic Development Plan	☒	• City Manager • Administrative Services	
Historic Preservation Plan	☒	• Community Development	HRI Update underway
Transportation Plan	☒	• Public Works • Community Development	Chapter 4 of the General Plan
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	• Public Works	Pacific Grove Municipal Code 11.97

Table I-10
Planning and Regulatory Capability

Document		Department	Comments
Zoning Ordinance	☒	• Community Development	Pacific Grove Municipal Code Title 23
Subdivision Ordinance	☒	• Community Development	Pacific Grove Municipal Code Title 24
Site Plan Review Requirements	☒	• Community Development	Ad-Hoc Committee review required for certain development projects
Unified Development Ordinance	☒	• City Manager	Pacific Grove Municipal Code 1.19
Post-Disaster Redevelopment/ Reconstruction Ordinance	☒	• Community Development	Pacific Grove Municipal Code Title 23- addresses destroyed buildings
Building Code	☒	• Community Development	Pacific Grove Municipal Code 18.04
Fire Prevention Code	☒	• Fire Department	Pacific Grove Municipal Code 18.32

Table I-11
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	• Community Development • Public Works	Planners on staff with this knowledge, City contracts with a civil engineer for general engineering assistance
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	• Community Development	City contracts with 4Leaf for building inspection, plan check, and additional engineering services
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	• Community Development	Planners on staff with this knowledge, City contracts with a civil engineer for general engineering assistance
Building Inspector	☒	• Community Development	City contracts with 4Leaf for building inspection, plan check, and additional engineering services
Emergency Manager	☒	• Police Department	
Floodplain Manager	☒	• Community Development	
Land Surveyors	☐		Contract as needed
Resource development staff or grant writers	☒	• Admin Services • Public Works • Police Department	
Public Information Officer	☒	• Police Department	Media Contacts, Website, City & Police Social Media platforms.

Table I-11
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Scientist(s) familiar with the hazards of the community	☐		Contract as needed
Staff with education or expertise to assess the community's vulnerability to hazards	☒	- Community Development - Public Works - Fire Department - Police Department	
Personnel skilled in Geographic Information Systems (GIS)	☒	IT/ Contract	Council is considering an IT Master Plan, which includes training of staff. Currently using contract services.
Maintenance programs to reduce risk	☒	Public Works	Contract Arborist
Warning systems/services	☒	- Monterey County - Police Department	AlertMonterey, Social Media Alerts
Mutual Aid Agreements	☒	- Police Department - Fire Department	Mutual Aid Agreements with Fire & Law Enforcement Agencies

Table I-12
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	Finance	City has a reserve policy, which includes funds for emergencies
Capital Improvements Project Funding	☒	- Public Works - Finance	
Special Purpose Taxes	☒	- City Council - Finance	The City could place an initiative on the ballot for a special purpose tax
Stormwater Utility Fees	☐		
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☒	- Public Works - Finance	The sewer fund balance could be used to mitigate any damage to the City's sewer infrastructure
Development Impact Fees	☒		TAMC
General Obligation Bonds	☒	Finance	The City is eligible to issue General Obligation Bonds.
Special Tax and Revenue Bonds	☒	- City Council - Finance	The City could place an initiative on the ballot for a special tax. The City's current local tax is a general tax and could be used for hazard mitigation
Community Development Block Grants (CDBG)	☒	Community Development	CDD manages existing CDBG program funds

Table I-13
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒ - Human Resources - Police Department - Fire Department	City Volunteer Programs, CERT, PGPD Citizens Academy Alumni
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒ - Police Department - Fire Department	Utilize Social Media outlets and community events to share emergency preparedness information
Natural disaster or safety related school programs	☐	
Public-private partnership initiatives addressing disaster-related issues	☒ Public Works	

Table I-14
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Building Code Effectiveness Grading Schedule	Yes	3	
ISO Public Protection Classification	Yes	2	
<i>StormReady</i> Certification	Yes	-	-
<i>TsunamiReady</i> Certification	Yes	-	-
<i>Firewise Communities</i> Certification	No	-	-

I.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table I-15
National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Alyson Hunter, Director, Community Development
NFIP Community Number:	060201
Flood Insurance Policies in Force:	35
Insurance Coverage in Force:	\$11,144,000
Written Premium in Force:	\$14,846
Total Loss Claims:	1
Total Payments for Losses:	\$6,784
Adopted Regulations that meet NFIP Requirements:	
• Pacific Grove Community Floodplain Management Municipal Code Chapter 11.97 [Ord. 09-006 § 2, 2009]	

Table I-15**National Flood Insurance Program (NFIP) Compliance****Date of last NFIP Community Assistance Visit (CAV):**

The City was visited by DWR staff on May 3, 2018. The result of the visit was the identification of new development within the SFHA (886 Cannery Row, aka, the Monterey Bay Aquarium). The DWR advised that a Substantial Improvement (SI) document be prepared to address this issue. This was resolved in June 2018. The second issue identified by the DWR during the CAV pertains to updating the City's Community Floodplain Management Ordinance (PGMC 11.97) to be in compliance with Title 44, CFR, Sec. 60.3 and reflect the current CA Model Floodplain Ordinance dated December 2006. The City adopted Ordinance 09-006 in 2009 to bring this chapter up to date.

Higher standards that exceed minimum NFIP requirement:

Although these may occur on a case-by-case basis, the City has not adopted "higher standards" that exceed NFIP minimum requirements. The City adopted a Substantial Improvement (SI) in a Special Hazard Flood Area (SHFA) procedure in 2018 to identify whether a property is within a designated SHFA and what sections need to be followed to be in compliance with FEMA regulations. The SI was prepared for the one area of the City's shoreline located in Flood Zone VE (FIRM Map Panel 06053C0307H (Revised June 21, 2017)). There are no other developments within the VE zone.

Additional floodplain management provisions:

The City's Local Coastal Program (LCP) certified in March 2020 has coastal hazards policies to help ensure that new development and redevelopment is sited and designed to be safe from coastal hazards. The City's [Shoreline Management Plan \(SMP\)](#) will be used to guide the management and maintenance of public infrastructure in the coastal zone.

Floodplain management activities performed that go beyond FEMA minimum requirements:

The City conducted a robust public outreach effort as part of the preparation of the SMP. These efforts included an online survey, an open house, and public workshops that highlighted the flood-related hazards along the coastline.

Existing impediments to running an effective NFIP program:

The City lacks operational capacity which results in impediments to running an effective NFIP program.

Specific actions that are ongoing or considered related to continued compliance with the NFIP:

- The City evaluates permit application forms to determine possible modifications focused on flood hazard prevention on an ongoing basis.
- The City maintains a map of areas that flood frequently and are subject to coastal hazards (Shoreline Management Plan). The City's Local Coastal Program (LCP) certified in March 2020 has coastal hazards policies to help ensure that new development and redevelopment is sited and designed to be safe from coastal hazards.
- The City will participate in local training efforts on floodplain management, the importance of participating in the NFIP, and the implications of failing to enforce the requirements of the program or failing to properly handle variance requests.
- The City's Building Official is trained on FEMA's Substantial Damage Estimator and is interested in pursuing additional training.
- The City provides free sandbag supplies to the public during winter months.

I.6.2 SELF-ASSESSMENT OF CAPABILITY

Table I-16
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	High
Administrative and Technical Capability	High
Fiscal Capability	Moderate
Education and Outreach Capability	High
Political Capability	Moderate
Overall Capability	High

I.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

I.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new

possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.

- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.
- **Local Coastal Program:** The City's updated Local Coastal Program was certified by the California Coastal Commission on March 11, 2020. It includes polices to reduce the risk of sea level rise, coastal flooding, and coastal erosion.
- **2015 Climate Change Vulnerability Assessment:** Identifies hazard vulnerability related to climate change.
- **2018 Shoreline Vulnerability Assessment:** Assess the risk and vulnerability of the Pacific Grove shoreline to a variety of hazards.
- **2020 Shoreline Management Plan:** Identifies Strategies to reduce the risk posed by a variety of hazards to the Pacific Grove shoreline.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans

- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

I.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Pacific Grove Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Pacific Grove are identified below:

- The City is concerned with limited ingress/egress to the community following major disaster events and continues to review and update designated evacuation routes through its emergency operations plan (currently being updated). A related concern is the narrow design of many city streets, which will make mobility and evacuation difficult during major events.
- The Monterey Interceptor pipeline, which transports all of the untreated sewage from the City of Monterey and Pacific Grove to the MRWPCA Regional Treatment Plant in Marina, is a critical facility deemed at risk to the long-term effects of coastal erosion and sea level rise, particularly between the Seaside Pump Station and Monterey Beach Resort.
- The public water supply is deemed a critical local issue for the city (and entire peninsula), particularly with regard to the supply available during future major fires. The City has seen hydrant pressure drops during past events.
- City staff asserts that the wildland fire hazard area for their jurisdiction is more expansive than previously mapped through FRAS and shown in the current plan. There are significant numbers of dead or dying trees in the heavily forested “Retreat” and park areas, which leads to higher risks, especially when combined with the fact that most surrounding residential construction is wood frame with Class C roofs (more combustible/ flammable).
- Widespread power outages are a concern for the City following major winter storms.
- The City relies solely on commercial internet service providers such as Comcast, AT&T, or Verizon for its communication network infrastructure. Connections from these providers is unreliable. The City should have access to a more reliable municipal broadband connection.
- The City is concerned about public health outbreaks, particularly with the recent events of COVID-19, for our significant at-risk population groups of both seniors and children. In addition, the City heavily relies on revenue sources related to tourism and additional closures could have detrimental impacts on local economic recovery, our small business community, and funding for basic City services.

I.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Pacific Grove Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table I-18* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table I-17* includes the status of actions completed or removed from the previous plan. In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table I-17

City of Pacific Grove Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
8	Adopt a Local Coastal Plan with the implementation of dune protection, stabilization, and nourishment to provide floodplain protection in the coastal areas. Additionally, wildlife safety should be linked with other environmental strategies throughout the Local Coastal Plan.	Completed	The City's updated Local Coastal Program was certified by the California Coastal Commission on March 11, 2020.

Table I-18
City of Pacific Grove Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing/ Continuous	All	Develop a sustained public outreach program that encourages consistent hazard mitigation content and improves public awareness and knowledge regarding all types of hazards, preparedness, and mitigation measures. Additionally, develop audience-specific hazard mitigation outreach efforts. Audiences include the elderly, children, tourists, non-English speaking residents, and home and business owners.	Priority / High	Disaster Planning, Community Development, Fire, CERT	General Funds, HMGP, and PDM Grants
2	Ongoing/ Continuous	Earthquakes	Develop an unreinforced masonry grant program that helps correct earthquake-risk nonmasonry building problems, including chimney bracing and anchoring water heaters. Additionally, ensure proper training on seismic codes for all buildings inspectors and encourage measures to reduce earthquake damage risk.	Moderate	Community Development, Building Division	General Funds
3	Ongoing/ Continuous	Tsunami, Winter Storms	Participate in the NOAA National Weather Service TsunamiReady and StormReady Programs.	Priority / High	Disaster Planning	General Funds
4	Ongoing/ Continuous	Tsunami	Maintain emergency vehicles with tsunami warning sirens and inform the public about the tsunami warning siren.	Moderate	Disaster Planning, Police Department	General Funds
5	In Progress/ 2-Years	Wildfire	Develop a Community Wildfire Protection Plan and implement recommended strategies.	Priority / High	Fire Prevention	General Funds, Grant Funds
6	In Progress/ 5-Years	Coastal Erosion, Flooding, Sea Level Rise	Implement Local Coastal Plan policies related to hazard mitigation.	Moderate	Community Development	General Funds, Grant Funds

Table I-18
City of Pacific Grove Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
7	In Progress/ 2-Years	Coastal Erosion, Flooding	Complete the Point Pinos Trail Project, which will remove the trail and beach parking out of the 30-year flood zone.	High	Public Works	General Funds, Grant Funds
8	Ongoing/ Continuous	Flooding, Sea Level Rise, Drought	Establish watershed-based planning to address flood hazards, sea level rise potentials and stormwater runoff problems and encourage techniques to reduce rainwater runoff, which can prevent flooding and erosion. Specifically, encourage major land alteration projects to include the use of pervious surfaces and rainwater collection technology.	High	Community Development	General Funds, Grant Funds,
9	In Progress/ 5-Years	Flooding, Sea Level Rise, Tsunami, Coastal Erosion, Wildfire, Dam Failure	Obtain and implement a GIS Master Plan. Use GIS to regularly calculate and document vulnerable areas such as: flood-prone areas, sea level rise, tsunami inundation zones, coastal erosion zones, wildland fire areas, and areas affected by dam failure. This information shall be used to create an inventory of especially vulnerable zones, buildings, properties, and infrastructure. Additionally, use GIS as a tool to inform the public on hazard risk.	Moderate	Public Works, Community Development, IT	General Funds
10	New/ 5-Years	All	Increase the resiliency of the communication system by creating redundancy so disruption to the system is minimized during and following disasters and to ensure continuity of government functions.	High	IT	General Funds, Grant Funds
11	New/ In Progress	All	Continue to coordinate with the Navy, the City of Monterey, the Presidio of Monterey, and Naval Support Activity Monterey on the Compatible Use Study, which looks at ways the military can better communicate and respond to hazardous situations in concert with neighboring municipalities.	Moderate	Community Development	General Funds

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ANNEX J: CITY OF SALINAS



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



J. CITY OF SALINAS

J.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Skylar Thornton
Battalion Chief/Fire Marshal
Salinas Fire Department
65 W Alisal Street., Ste 210
Salinas, CA 93901
(831) 758-7422
skylart@ci.salinas.ca.us

J.2 COMMUNITY PROFILE

J.2.1 LOCATION



J.2.2 GEOGRAPHY AND CLIMATE

The City of Salinas is the County seat and largest city in Monterey County and on California's Central Coast. Located at the northern opening of the Salinas Valley, it is situated ten miles west of Monterey Bay and the Pacific Ocean, approximately mid-way between Santa Cruz and the Monterey Peninsula.

The City encompasses an area of 37.9 square miles at an elevation of approximately 52 feet above sea level. Salinas' weather is influenced by its proximity to Monterey Bay. The morning fog is generally cleared by afternoon breezes. Salinas enjoys a mild climate with an average high of 68°F and low of 46°F and annual rainfall of 15.47 inches.

J.2.3 HISTORY

Salinas' earliest inhabitants were small tribes of Native Americans who were largely undisturbed during the Spanish era. It was not until Mexico gained independence from Spain in 1822 that outside settlers began to arrive in Salinas. Named for a nearby salt marsh, Salinas became the seat of Monterey County in 1872 and incorporated in 1874.

In the mid-1800s, Salinas' agricultural industry began to grow. In 1867, several local businessmen laid-out a town plan and enticed the Southern Pacific Railroad to build its tracks through Salinas City. Agriculture continued as the area's major industry and by the end of World War I, the "green gold" growing in the fields helped make Salinas one of the wealthiest cities (per capita) in the United States. During the growing seasons of the Great Depression, the volume of telephone and telegraph transmissions originating in Salinas was greater than that of San Francisco. This activity was reflected in a burst of building construction, many employing the streamlined shapes and organic patterns of Art Deco or Art Moderne.

J.2.4 POPULATION

The population of the City of Salinas is 163,542 people (2020 Census), an 8.7% increase since 2010. Salinas is the largest city in Monterey County. More than one in three County residents lives in Salinas.

J.2.5 GOVERNING BODY FORMAT

The City of Salinas is organized under the Council-Manager form of government. The City Council is composed of six Council Members who are elected by district for four-year terms, and a Mayor elected at large for a two-year term. The City Manager, who is appointed by City Council, is responsible for all City departments except the appointed City Attorney. The City Council legislates policies, enacts ordinances, approves the budget, and appoints advisory boards and commissions.

J.2.6 ECONOMY AND TAX BASE

The City of Salinas is the County's center for agricultural activity and the headquarters to many large growing and shipping companies. Although agriculture forms the primary economic base, more than 100 manufacturing firms are also located in the city. Some of the largest employers in the area include Taylor Farms, Ramco, the County of Monterey, and Salinas Valley Memorial Hospital. The City has a large suburban community, which consists mostly of late 20th century single family residences, ranging from modest bungalows to spacious homes. The city's historic Main Street has undergone recent revitalization and boasts an emerging arts scene

J.3 PLANNING PROCESS

The City of Salinas followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Salinas held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on July 13, 2021. Key stakeholders present at the meeting included:

- Steve Carrigan, City Manager
- Samuel Klemek, Deputy Fire Chief
- Skylar Thornton, Battalion Chief/ Fire Marshal
- David Jacobs, Public Works Director
- Jim Pia, Assistant City Manager
- Marina Horta-Gallegos, HR Director
- Adriana Robles, City Engineer
- Michele Vaughn, Fire Chief
- Courtney Grossman Planning Manager
- Andrew Myrick, Senior Economic Development Manager
- John C. Murray, Police Commander
- Chris Callihan, City Attorney
- Roberto Filice, Acting Police Chief

J.4 LAND USE AND DEVELOPMENT

Over the past 50 years, the community of Salinas has grown significantly. In 1950, Salinas was a small agricultural community of 14,000 persons, but has expanded to become the largest city in the County. The current Salinas General Plan was adopted in 2002 and the City is currently in the process of a General Plan update. At the time of the 2002 General Plan, about 33% of the City's area was devoted to residential uses. Commercial retail uses were approximately 9% and industrial uses 6%. While Salinas is surrounded by lands considered as "prime farmland," the lands to the south and west of the City are the most productive. In April 2008, the City Council adopted an Agricultural Land Preservation Program, which contains measures to preserve agricultural lands to the south and west.

Since 2015, the City of Salinas has completed over 12 major planning efforts, many of which focus on infill opportunities that direct development away from hazard areas. Two examples include the [Downtown Vibrancy Plan](#) (2015) and [Alisal Vibrancy Plan](#) (2019). Salinas has very little housing in its downtown core compared to other cities and the Downtown Vibrancy Plan calls for over 650 units, mostly on existing surface parking lots, to address this "housing desert." Removing parking from a downtown is often a politically difficult proposition, but Council's approval showed a willingness to enact policies supporting denser development in the urban core, away from potential hazards. The Alisal is a disadvantaged neighborhood in Salinas with a significant need for affordable housing. The Alisal Vibrancy Plan also calls for infill development to help meet its built environment needs, in particular better utilization of land along the Market Street and East Alisal Street commercial corridors,

and on vacant lots. The Alisal Vibrancy Plan also calls for more integration of Low Impact Design and green infrastructure in new development and public areas, which help manage stormwater and reducing flood risks. Implementation of the Downtown Vibrancy Plan and Alisal Vibrancy Plan is underway, and the City is in the process of rezoning multiple surface parking lots and other opportunity sites for mixed use development.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is in a position to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the 2016 Plan. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**. The Salinas Safe Growth Survey was completed by Adriana Robles, City Engineer for the City of Salinas Public Works Department. The results are summarized in *Table J-1*.

Table J-1
City of Salinas Safe Growth Survey Results

Topic Area	2021	2016
Land Use	4.00	4.50
Transportation	3.00	3.33
Environmental Management	4.33	3.00
Public Safety	3.00	4.00
Zoning Ordinance	3.25	4.25
Subdivision Regulations	2.67	3.00
Capital Improvement Program & Infrastructure Policies	2.33	3.00
Building Code	4.00	5.00
Economic Development	1.00	3.00
Average Survey Ratings	3.06	3.68

J.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Salinas's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Salinas is included in this Annex.

The City of Salinas's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table J-2* displays the results of the hazard risk ranking exercise that was performed by the City of Salinas's Planning Team.

Table J-2
Threat Hazard Identification Risk Assessment (THIRA): City of Salinas

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	3.0	2.8	2.9	2.8	11.5	Substantial
Coastal Erosion	1.1	1.2	1.3	1.3	4.9	Slight
Coastal Flooding	1.5	1.4	1.8	1.6	6.3	Possible
Cyber-Attack	3.0	3.2	3.1	3.4	12.7	High
Dam Failure	1.9	1.7	2.2	2.3	8.1	Moderate
Drought & Water Shortage	3.7	3.3	3.2	3.4	13.6	High
Earthquake	3.4	3.2	3.4	3.3	13.3	High
Epidemic	3.0	2.8	3.0	2.9	11.7	Substantial
Extreme Cold & Freeze	2.0	2.0	1.9	1.9	7.8	Possible
Extreme Heat	1.9	2.2	1.7	1.9	7.7	Possible
Flash Flood	1.9	2.0	2.3	2.3	8.5	Moderate
Hazardous Materials Incident	2.7	2.7	2.7	2.8	10.9	Substantial
Invasive Species	1.6	1.5	1.7	2.0	6.8	Possible
Levee Failure	1.4	1.3	1.3	1.3	5.3	Slight
Localized Stormwater Flooding	2.6	2.9	2.3	2.3	10.1	Substantial
Mass Migration	1.9	1.9	1.8	1.8	7.4	Possible
Pandemic	2.8	2.3	3.4	3.2	11.7	Substantial
Riverine Flooding	1.8	1.9	2.0	1.9	7.6	Possible
Sea Level Rise	1.3	1.4	1.6	1.6	5.9	Possible
Severe Winter Storms	2.3	2.4	2.5	2.5	9.7	Moderate
Slope Failure	1.4	1.5	1.4	1.4	5.7	Slight
Targeted Violence	2.5	2.6	2.5	2.7	10.3	Substantial
Terrorism	1.8	1.6	2.5	2.5	8.4	Moderate
Tsunami	-	-	-	-	-	-
Utility Interruption/ PSPS	2.8	2.9	2.5	2.4	10.6	Substantial
Water Contamination	2.5	2.3	3.2	3.1	11.1	Substantial
Wildfire	2.3	2.4	2.5	2.6	9.8	Moderate
Windstorms	2.3	2.2	2.3	2.3	9.1	Moderate

J.5.1 AGRICULTURAL EMERGENCIES

The agricultural industry is a major economic driver in the City. Agricultural disasters pose a serious threat to the local economy and populations directly employed by the agriculture industry.

J.5.2 COASTAL EROSION

The City is not located on the coast, and therefore coastal erosion is not a major threat. Coastal erosion does threaten agricultural land in the Salinas Valley. Salinas is the hub for agriculture processing, therefore, if coastal erosion affects agriculture land outside the City, such affects could have indirect economic effects on the local economy. The City could also be impacted by other types of erosion not profiled in this Plan.

J.5.3 DAM AND LEVEE FAILURE

Dam Failure

There are no population, property, or infrastructure in the City located in the dam inundation zones of the Los Padres and Forest Lake dams.

Salinas also has the potential for inundation due to the failure of the Nacimiento and San Antonio Dams. *Table J-3* summarizes population and property in the City exposed to spillway and dam failure of the Nacimiento and San Antonio dams.

Table J-3

Population and Property Exposed to Dam Failure Risk by Dam and Failure Type in Salinas

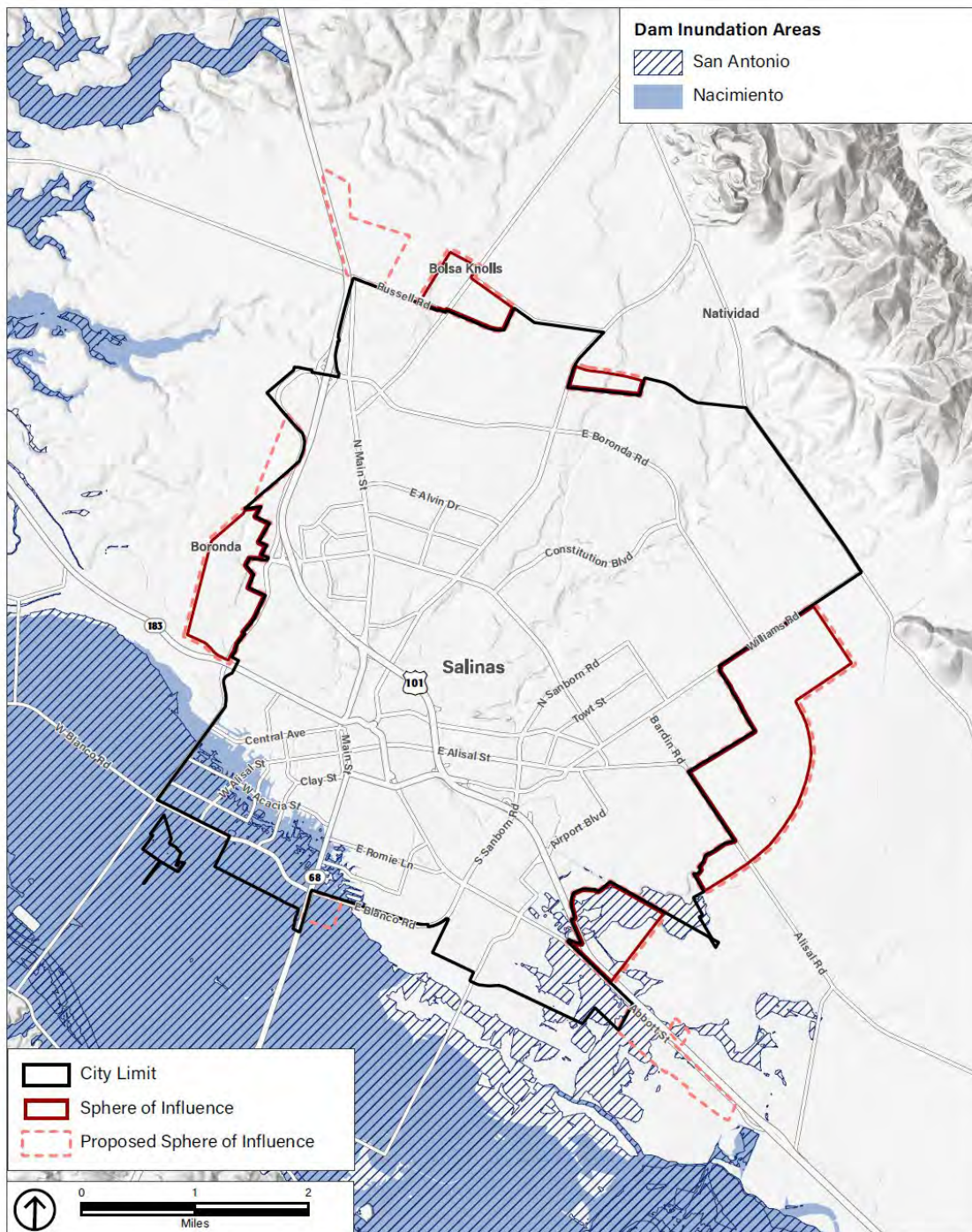
Dam Failure Scenario	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Nacimiento Spillway Failure	1,018	5	\$2,329,906	8	\$154,697
Nacimiento Dam Failure	10,545	2,425	\$1,077,104,095	804	\$245,485,534
San Antonio Spillway Failure	0	0	\$0	0	\$0
San Antonio Dam Failure	8,825	1,805	\$812,166,160	701	\$316,793,892

A failure of the Nacimiento dam would expose 3 medical facilities, 6 government facilities, 7 communication facilities, and approximately 33 miles of roads to inundation risk. Major roads and possible evacuation routes exposed includes Blanco Road, Davis Road, Harkins Road, and Highway 68 on south end of the City, as well as Highway 183 northwest of City limits.

A failure of the San Antonio dam would expose 3 medical facilities, 2 educational facilities, 6 government facilities, 6 communication facilities, and approximately 31 miles of major to inundation risk. Major roads and possible evacuation routes exposed includes Abbot Street and Highway 101 on southeast end of the City, Blanco Road, Davis Road, Harkins Road, and Highway 68 on south end of the City, as well as Highway 183 northwest of City limits.

Dam inundation areas for the Nacimiento and San Antonio dams located in the City of Salinas is mapped in *Figure J-1*.

Figure J-1
Dam Inundation Areas in the City of Salinas



Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

J.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Drought also is often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution. A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

J.5.5 EARTHQUAKE

No known active faults are located in the City and no Alquist-Priolo Earthquake Fault Zoning has been established by the State for the City. Consequently, the potential for ground rupture is low. Although the potentially active King City and Gabilan Creek Faults (active within the last three million years, though not the last 11,000 years) are located within the City, they are not expected to generate seismic activity. The greatest seismic threat is related to the San Andreas and Calaveras Faults.

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk. According to Monterey County Assessor records, there are 32,057 residential and non-residential buildings in the City, with a total value of \$12,421,420,074. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

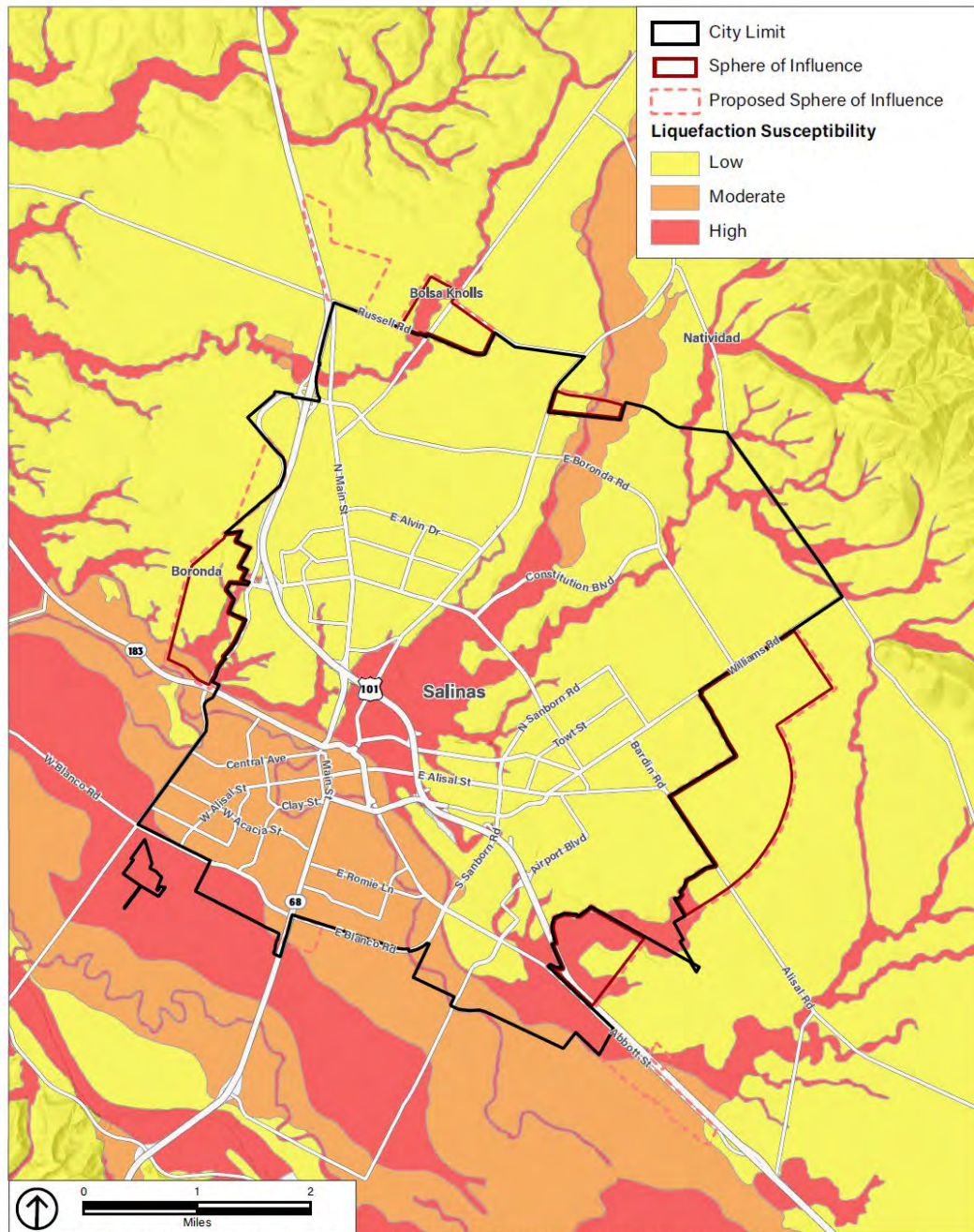
Damage from earthquakes is often the result of liquefaction. Liquefaction occurs primarily in areas of recently deposited sands and silts and in areas of high groundwater levels. Especially susceptible areas include sloughs and marshes that have been filled in and covered with development. Salinas has several former wetland areas that have been "reclaimed" (drained and filled) and developed. In addition, Salinas rests on almost 1,800 feet of alluvium. *Table J-4* summarizes population and property in the City exposed to liquefaction risk.

Table J-4
Population and Property Exposed Liquefaction Risk in Salinas

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	40,954	2,233	\$1,140,950,365	2,424	\$1,255,332,144
Moderate Liquefaction Susceptibility	24,168	4,947	\$2,249,148,956	3,114	\$1,075,645,532

Additionally, 2 emergency response facilities, 5 medical facilities, 24 government facilities, 67 communication facilities, some facilities containing hazardous materials, 5 miles of railroad, and about 80 miles of road are in a high liquefaction zone. Major roads and possible evacuation routes exposed includes portions of Highway 101, Abbot Street, Blanco Road, Highway 68, Davis Road, San Juan Grade Road, E Laurel Drive, and Old Stage Road, as well as Highway 183 northwest of City limits. *Figure J-2* shows areas of liquefaction susceptibility within the City.

Figure J-2
Liquefaction Susceptibility in the City of Salinas



Source: Relative Liquefaction Susceptibility of Monterey County, California, 2001; Monterey County Planning Department.

J.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table J-5* summarizes population and property in the City in the 1% annual chance and 0.2% annual chance floodplain.

Table J-5
Population and Property Exposed to Flooding Risk in Salinas

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
1% Annual Chance	15,415	502	\$343,901,823	704	\$379,194,821
0.2% Annual Chance	130,440	22,355	\$8,837,316,183	8,542	\$2,803,988,821

Portions of the Salinas Municipal Airport, 3 educational facilities, 5 government facilities, 5 communication facilities, and approximately 21 miles of road is located in the 1% annual chance floodplain. Major roads and possible evacuation routes located in the floodplain include portions of Highway 101, Abbot Street, and E Laurel Drive, as well as Blanco Road west of City limits and Highway 183 northwest of City limits. *Figure J-3* shows the extent of the 1% annual chance and 0.2% annual chance floodplain in the City.

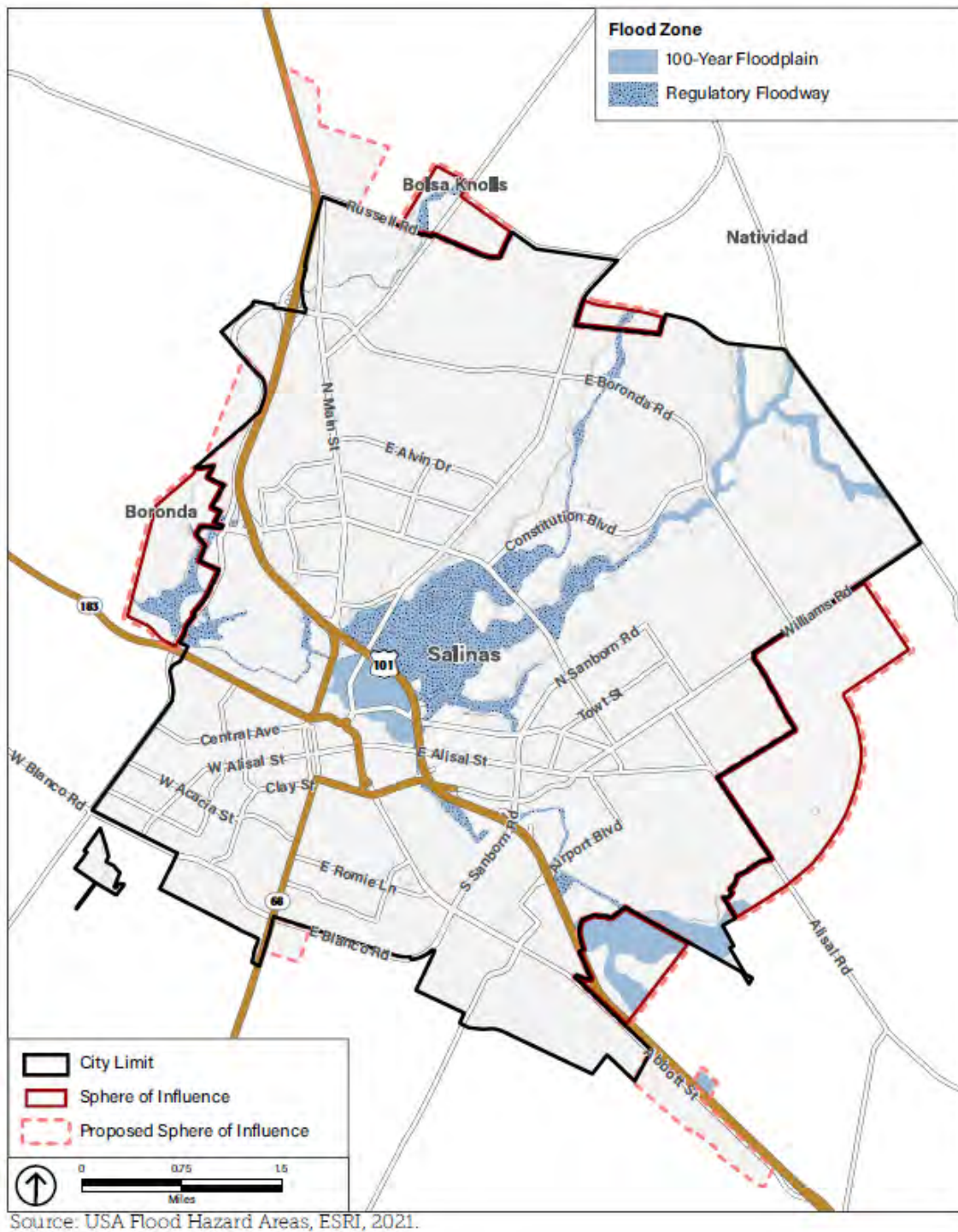
The Salinas area topography includes creeks and lakebeds that are dry during most of the year and figure prominently as open space within the City. Except for the Salinas River creeks, streams, and lakes are seasonal. Four natural channels flow from the Gabilan Mountains into the Salinas area. These include Alisal, Natividad, Gabilan, and Santa Rita Creeks. The Gabilan Creek channel has experienced siltation problems between Boronda Road and Laurel Drive, and within Carr Lake reducing the capacity of the creek. All of these creeks are tributary to the Monterey County Water Resources Agency (MCWRA) Reclamation Ditch 1665, although the Santa Rita Creek intersects the Reclamation Ditch 3.5 miles west of the city limits. This channel serves as the primary drainageway for the City.

Flood-prone areas in the City generally fall into a wide band on either side of the creeks, in the vicinity of the airport, and a narrow strip along the Reclamation Ditch running northwest-southwest through the City. The following areas in the City of Salinas have a known potential for flooding:

- Carr Lake
- Cesar Chavez Park
- Gabilan Creek
- Kern Street
- Market Street
- Merced Street
- Natividad Creek
- Reclamation Ditch
- Salinas River
- Williams Road

This is not a complete list of areas that are within flood zones, but rather a list of areas with documented flooding problems.

Figure J-3
FEMA 1% Annual Chance and 0.2% Annual Chance Floodplain



J.5.7 HAZARDOUS MATERIALS INCIDENT

Hazardous materials are used in Salinas for a variety of purposes including manufacturing, agriculture, medical clinics, service industries, small businesses, schools, and households. The use

of pesticides in agricultural operations is a large source of hazardous materials within the planning area since the City is surrounded by agricultural operations, and there are agricultural activities in Carr Lake. Hazardous materials also pass through the City in route to other destinations via the freeway, rail, and surface street system. The major transportation routes through the City are Highway 101 and the Union Pacific railroad.

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table J-6 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table J-6 Population and Property Exposed to Hazardous Materials Incident Risk in Salinas					
Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	82,575	12,974	\$5,030,795,622	7,624	\$2,888,369,090
Fixed Source	74,602	10,239	\$3,740,878,882	5,872	\$2,019,200,894

J.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident. Of particular concern to the City of Salinas is the risk of both cyber-attacks and targeted violence.

The entire population of the City is exposed to cyber-attacks personally or at places of employment. All populations who use a computer or receive services from automated systems are exposed to cyber-terrorism. Because it is difficult to predict the particular target of cyber-terrorism, assessing vulnerability to the hazard is difficult. All critical facilities and infrastructure that are operated by a computer system are exposed to cyber-attacks.

A targeted violence event could range from an individual attack to a coordinated attack by multiple agents upon multiple targets. Large-scale incidents have the potential to kill or injure many people in the immediate vicinity and may also affect people a relative distance from the initial event.

All structures in the City are physically vulnerable to a targeted violence event. The emphasis on accessibility, the opportunity for roof access, driveways underneath some structures, unmonitored areas, the proximity of many structures to transportation corridors and underground pipelines, and the potential for an active shooter to strike any structure randomly all have an impact on the vulnerability of structures. Schools, churches, large event venues, and workplaces are known locations of previous targeted violence incidents and are likely more vulnerable to attack.

All critical facilities and infrastructure could be impacted by targeted violence. The economic impact price tag of potential losses from targeted violence could be huge if lives are lost, jobs are lost, and assets are damaged. Violence can cause fear in residents and visitors to go into public spaces in the City, which could affect the economy.

J.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

J.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage.

All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts.

FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table J-7*.

Table J-7
Annualized Frequency and Exposure to Severe Weather Events in Salinas

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.34	Frequency (<i>Distinct Events</i>)	0.09
Exposed Population	143,754	Exposed Population	143,754
Exposed Building Values	\$10,738,627,000	Exposed Building Values	\$10,738,627,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$342
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	0.37	Frequency (<i>Distinct Events</i>)	1.31
Exposed Population	142,690	Exposed Population	132,092
Exposed Building Values	\$10,655,330,097	Exposed Building Values	\$8,861,762,209
Expected Annual Loss of Building Value	\$18	Expected Annual Loss of Building Value	\$230,288,984
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.50	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	143,754	Exposed Population	0
Exposed Building Values	\$10,738,627,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$1,086	Expected Annual Loss of Building Value	\$0

Source: FEMA National Risk Index

J.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 5,295 people and \$211,035,578 in building value in the City is exposed to landslide risk. Additionally, the City is not susceptible to earthquake induced to landslides.

Most of the City has slopes of 1 to 10%, although a few areas have slopes from 10 to 30%. To the east of the City, slopes increase toward the Gabilan Mountains; northeast of the City, slopes from 10 to 30% become more common. The risk of slope failure is associated with the hillsides surrounding the City. As development extends out closer to these areas, the risk of slope failure will increase. The fact that many homes are built on view property atop or below bluffs and on steep slopes subject to failure, further increases the risk. Slope failure events can block egress and ingress on roads and significantly impact bridges, causing isolation for neighborhoods, traffic problems, transportation delays.

J.5.12 TSUNAMI

The City is not located in a mapped tsunami inundation zone.

J.5.13 UTILITY INTERRUPTION

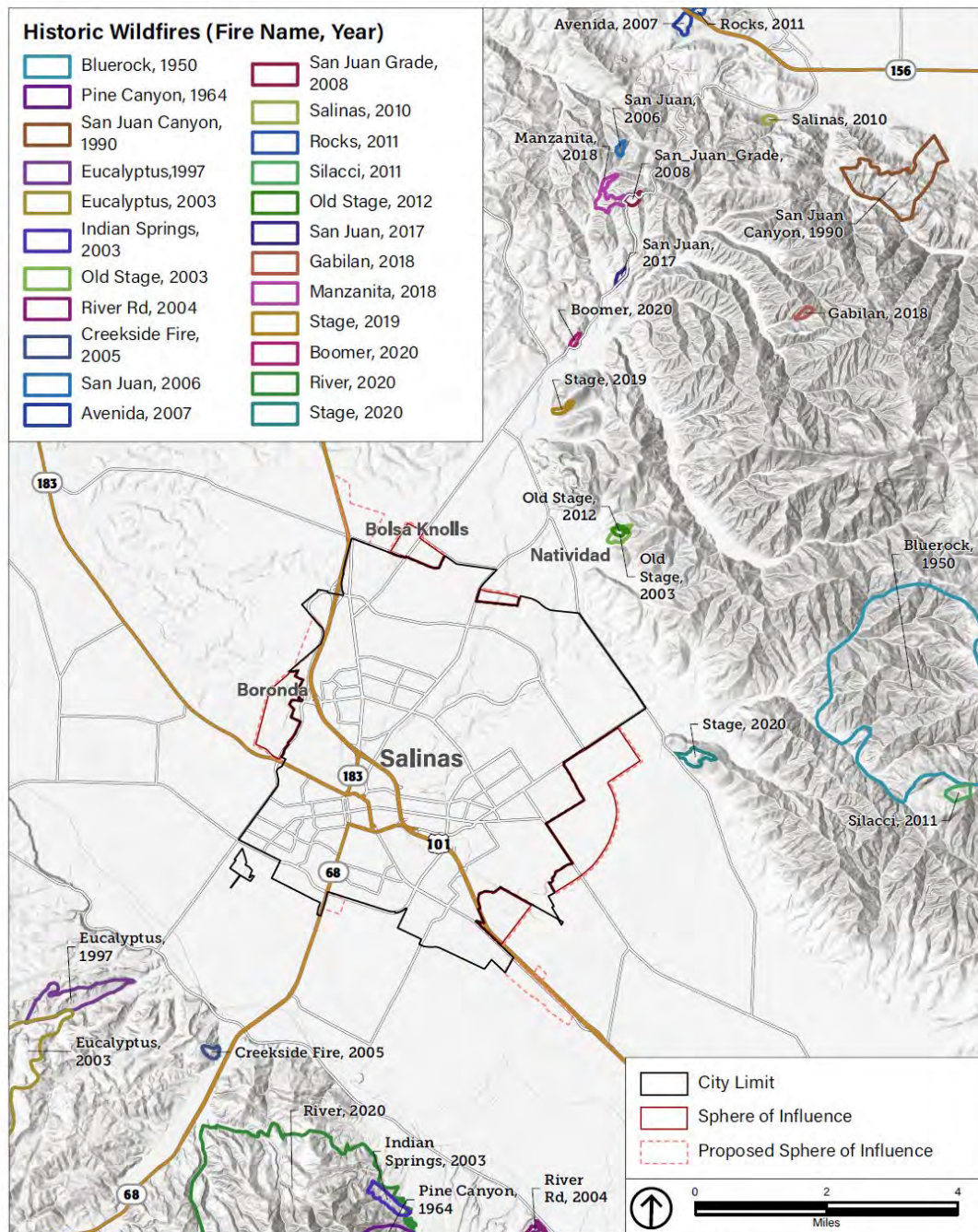
All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption. Additional emergencies occurring during power disruptions can compound the effects of utility interruption and influence the timeline of restoration. Depending on the

circumstances surrounding the incident, utility disruption can impact transportation/fuel, communications, housing, critical infrastructure, first response, and the economy.

J.5.14 WILDFIRE

The location of historical fires surrounding the City of Salinas is mapped in *Figure J-4*.

Figure J-4
Historic Wildfires



Source: California Department of Forestry and Fire Protection (CALFIRE), 2021.

Note: Data obtained from CALFIRE for the Creekside (2005) Fire shows slightly different areas as recorded by the Bureau of Land Management and CALFIRE. This map defaults to the CALFIRE data.

To assess wildfire risk, CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table J-8 summarizes population and property in the City in very high, high, and moderate fire threat areas.

Table J-8
Population and Property Exposed to Wildfire Risk in Salinas

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	3,812	27	\$14,947,547	435	\$49,467,844
Moderate Fire Threat	30,029	548	\$414,954,233	1,403	\$788,528,084

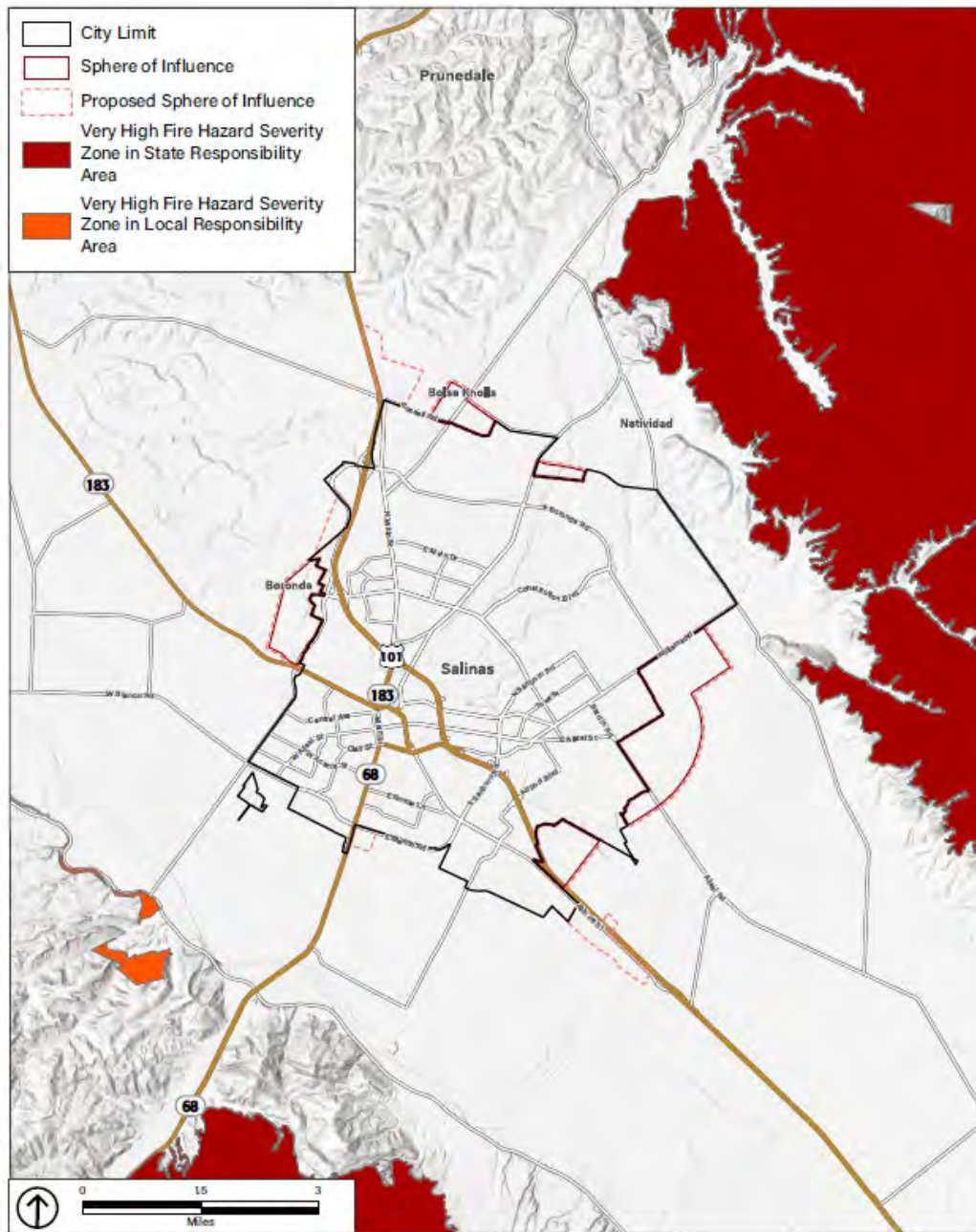
Though no critical facilities are located in very high or high fire threat zones, 1 fire station, 7 government facilities, and 11 communication facilities, and approximately 50 miles of road is located in a moderate fire threat area

Since Salinas is an urbanized community surrounded by agricultural lands, the greatest fire risk in Salinas is urban fires. Though no area within the City have been mapped as located in a Fire Hazard Severity Zones (FHSZ) by CAL FIRE, some surrounding areas have been designated as Very High Fire Hazard Severity Zones, as seen in *Figure J-5*. A risk of wildland fires is associated with these rangelands on the hillsides surrounding the City. As development extends out closer to these areas, the risk of wildland fires will increase.

Additionally, smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations including children, the elderly, and those with respiratory and cardiovascular diseases. Smoke generated by wildfire contains visible and invisible emissions comprising particulate matter such as soot and tar; gases such as carbon monoxide, carbon dioxide, and nitrogen oxides; and toxics such as formaldehyde and benzene. Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency or temperature of combustion, and the weather. Wildfires occurring in areas surrounding the City could lead to secondary public health risks.

Agriculture, a key economic driver for the City, is also vulnerable to wildfire risk. Structures, irrigation systems, and equipment, crops, livestock, and stored commodities can be lost to wildfire. Fires can also affect soil quality and smoke can have many negative impacts on crops. Fires also create a high-risk environment for agricultural workers. In addition to the dangers of an active fire, wildfire smoke, ash, and chemicals used to treat fires negatively affect air and water quality.

Figure J-5
Very High Fire Hazard Severity Zones Surrounding the City of Salinas



Source: State of California Department of Forestry and Fire Protection, Fire and Resource Assessment Program, 2007; City of Salinas, 2021.

J.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures will have direct impacts on public health and infrastructure. Drought,

flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the local economy, along with changes to agriculture and crops, which are a critical backbone of the City's economy.

J.6 CAPABILITY ASSESSMENT

The City of Salinas performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table J-9*
- An assessment of administrative and technical capabilities is presented in *Table J-10*
- An assessment of fiscal capabilities is presented in *Table J-11*
- An assessment of education and outreach capabilities is presented in *Table J-12*
- Classifications under various community mitigation programs are presented in *Table J-13*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section J.6.1 in *Table J-14*
- An overall self-assessment of capability is presented in Section J.6.2 in *Table J-15*

Table J-9
Planning and Regulatory Capability

Document	Department	Comments
Planning Documents		
General Plan	☒ • City Admin	
Capital Improvement Plan	☐	Unknown
Floodplain Management Plan	☒ • Public Works	City Engineer
Open Space Management Plan	☒ • Planning	
Stormwater Management Plan	☒ • Public Works	NPDES Permit Manager
Coastal Management Plan	☐ •	Not applicable
Local Coastal Program	☐	Not applicable
Climate Action/ Adaptation Plan	☒ • Public Works • Community Development	Needs update
Emergency Operations Plan	☒ • Fire Department	Needs update
Continuity of Operations Plan	☒ • Fire Department • Police Department • City Hall	
Community Wildfire Protection Plan	☐	Not applicable
Evacuation Plan	☒ • Public Works • Fire	In the Dam Failure Plan
Disaster Recovery Plan	☐ •	Unknown
Economic Development Plan	☒ • City Hall	Economic Development Manager
Historic Preservation Plan	☒ • Community Development	

Table J-9
Planning and Regulatory Capability

Document		Department	Comments
		City Hall	
Transportation Plan	☒	Public Works	Traffic Engineer
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	Public Works	
Zoning Ordinance	☒	Community Development	
Subdivision Ordinance	☒	- Community Development - Public Works	
Site Plan Review Requirements	☒	- Community Development - Public Works	
Unified Development Ordinance	☐		Unknown
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐		Unknown
Building Code	☒	Community Development	
Fire Prevention Code	☒	Fire Department	

Table J-10
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	Public Works	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	Public Works	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	Public Works	
Building Inspector	☒	Community Development	
Emergency Manager	☒	Fire Department	Fire Chief
Floodplain Manager	☒	Public Works	City Engineer
Land Surveyors	☐		
Resource development staff or grant writers	☒		Each department handles its own grants.
Public Information Officer	☒	Fire Department	
Scientist(s) familiar with the hazards of the community	☐		
Staff with education or expertise to assess the community's vulnerability to hazards	☒	- Public Works - Fire Department - Police Department	

Table J-10
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Personnel skilled in Geographic Information Systems (GIS)	☒	• Public Works	GIS Division
Maintenance programs to reduce risk	☒	• Public Works	
Warning systems/services	☒		Everbridge
Mutual Aid Agreements	☒	• Fire Department	

Table J-11
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	• Finance	
Capital Improvements Project Funding	☒	• Finance	
Special Purpose Taxes	☒	• Finance	
Stormwater Utility Fees	☒	• Finance	
Gas / Electric Utility Fees	☒	• Public Works • Finance	
Water / Sewer Fees	☒	• Finance	
Development Impact Fees	☒	• Public Works	
General Obligation Bonds	☐		
Special Tax and Revenue Bonds	☒	• Finance	
Community Development Block Grants	☒	• Community Development	

Table J-12
Education and Outreach Capability

Educational and Outreach Resources		Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒	• Community Development	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒	• Public Works • Fire Department	Social Media
Natural disaster or safety related school programs	☒	• Fire Department	Social Media
Public-private partnership initiatives addressing disaster-related issues	☐		

Table J-13
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	Yes	7	10/1/2013
ISO Public Protection Classification			
StormReady Certification			
TsunamiReady Certification	No	-	-
Firewise Communities Certification	No	-	-

Political Capability

Salinas has a General Plan in place, including a robust Economic Development Element. Additionally, the City has a variety of plans including:

- Public Art Master Plan (2020)
- Alisal Vibrancy Plan (2019)
- Parks, Recreation, and Libraries Master Plan (2019)
- Downtown Vibrancy Plan (2015)
- Salinas Ag-Industrial Center Specific Plan (2009)
- Central Area Specific Plan (2020)
- Chinatown Revitalization Plan (2019)
- West Area Specific Plan (2019)
- Gateway Center Specific Plan (2011)

All of these plans detail the outline of where City resources will be allocated to either improve quality of life, improve safety, or improve hazard mitigation.

J.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table J-14
National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Adriana Robles, City Engineer
NFIP Community Number:	060202
Flood Insurance Policies in Force:	317
Insurance Coverage in Force:	\$95,459,500
Written Premium in Force:	\$320,007
Total Loss Claims:	31
Total Payments for Losses:	\$160,884
Adopted Regulations that meet NFIP Requirements:	
• Flood Damage Prevention, Chapter 9, Article VI of the Municipal Code, adopted October 19, 2010 • Flood Overlay District, Zoning Code, Chapter 37, Article IV of the Municipal Code, adopted July 23, 2013 • Flood Insurance, Subdivision Ordinance, Section 31-705 of the Municipal Code, adopted December 13, 2016	
Date of last NFIP Community Assistance Visit (CAV):	
September 2016. Provided building information on six (6) structures built in the floodplain.	
Higher standards that exceed minimum NFIP requirement:	
• Freeboard requirement is two (2) feet above the Base Flood Elevation. • General Plan includes requirement for a 100-foot setback to top of creeks near riparian areas.	

Table J-14
National Flood Insurance Program (NFIP) Compliance

Additional floodplain management provisions:

Floodplain regulations are included in area plans such as the Central Area Specific Plan and West Area Specific Plan. The 2002 General Plan includes provisions for protections of wetland and riparian areas, along with floodplains and floodways.

Floodplain management activities performed that go beyond FEMA minimum requirements:

The City of Salinas maintains a monthly log of all the maintenance required of drainage systems and the yardage of any trash removal for all waterways, outfalls, inlet filters, ditches, and basins.

The City's public education and outreach includes brochures for illicit discharges, annual flood insurance promotion to all residences within the floodplains and flood risk awareness and flood insurance social media posts and posters in our permit center.

Existing impediments to running an effective NFIP program:

The biggest challenges are funding and lack of staff to run a more effective program.

Specific actions that are ongoing or considered related to continued compliance with the NFIP:

- Maintain digital FEMA elevation certificates for all construction in the floodplain.
- Evaluate permit applications to determine possible modifications focused on flood prevention.
- Develop a checklist for review of building/development permit plans and for inspection of development in floodplains.
- Establish a goal to have each plan reviewer and building inspector attend a training periodically.
- Encourage or require certain local staff positions to obtain and maintain Certified Floodplain Manager (CFM) certification.
- Maintain a map of areas that flood frequently and prioritize those areas for inspection immediately after the next flood. If outside FEMA special flood hazard areas, consider requiring existing NFIP regulatory standards through overlay zoning, etc.
- Hold informative work sessions for newly elected officials and new appointees to planning commissions and appeals/variance boards, to provide an overview of floodplain management, the importance of participating in the NFIP, and the implications of failing to enforce the requirements of the program or failing to properly handle variance requests.
- Obtain FEMA's Substantial Damage Estimator and attend training; develop mutual aid agreements with other jurisdictions to augment local personnel after disasters.
- Conduct a review of other regulatory programs and planning tools, and report on opportunities to improve consistency with the objectives of floodplain management.
- Develop handouts for permit applications on specific issues such as installation of manufactured homes in flood hazard areas according to HUD's installation standards, or guidance on improving/repairing existing buildings to better withstand potential hazards.

J.6.2 SELF-ASSESSMENT OF CAPABILITY

Table J-15
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	High
Administrative and Technical Capability	Moderate
Fiscal Capability	Limited
Education and Outreach Capability	Moderate
Political Capability	Moderate
Overall Capability	Moderate

J.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

City of Salinas can improve its capability at hazard mitigation by sharing the capabilities between departments. The City can place department specific capabilities in a shared folder that gets updated every 3-5 years. City personnel could drill on the occurrence of various hazards in the city and what the trigger points are for involvement of different departments; based on hazard type.

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

J.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

J.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Salinas Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Salinas are identified below:

- The City is vulnerable to major flooding events that can cause moderate damages. While a major concern, the Salinas River is not the only source of potential flooding, various tributaries including Natividad Creek, Santa Rita Creek, and Alisal Creek are not adequately conveyed through the City to the Salinas River due to backflow issues and inadequate drainage systems. One area of particular concern for future flood damages is the Sherwood Park Mobile Home Park and surrounding areas downstream of Carr Lake (and reclamation ditch maintained by Monterey County) in the center of the City.
- The City faces unique vulnerabilities to major hazard events due to its relatively high population and development density (the highest in Monterey County), particularly with regard to earthquake ground-shaking events that could have community-wide impacts.
- The City is vulnerable to large wind and storm events which can cause significant infrastructure damage and power outages. Severe storms can overwhelm emergency response resources. The City's Public Works Yard is also located in an area vulnerable to flooding, which could affect response capabilities.
- The City has extensive vulnerabilities related to homelessness issues in waterways and flood risk. Stormwater is tightly regulated by the state. The volume of people living in the City's waterways is increasing. Tied to the increase in the volume of people is the associated debris and waste generated. The trash and associated living components create waste that can clog culverts and grates, leading to backing up the system and impacting residents, roads, and businesses. Additionally, there is a human waste component leading to additional contamination of runoff.
- The City of Salinas has steps in place to mitigate Cyber-attacks. Through external vulnerability tests and user "clicker" education, the City does provide mitigation to avoid attacks. The City has IDS/IPS protection on the edge of the network and implements 2FA. Cyber-attacks are challenging to avoid. The City uses a scalable VDI environment for most every user, so a compromised system can be immediately isolated and wiped if needed. The City uses a zero-day attack vector protection on each virtual machine to help notify and mitigate attacks. The City also implements an email forwarding notification system and implements a Personal Identifiable Information (PII) mitigation blocking system to help keep any PII attacks/breaches to a minimum, or if PII is sent out of the

network. Additional education is needed to further improve recognizing various threats from all sources.

- The City of Salinas has a wide variety of hazardous materials in its jurisdiction. The City of Salinas has Southern Pacific Railroad and Highway 101 running through its jurisdiction. With that, there is a high volume of Hazmat moving through City limits daily. Most of the City's fixed hazmat sources are related to agriculture, in the form of refrigerants and pesticides. The volumes and types of hazardous materials are regulated by Monterey County. The City of Salinas as a whole is vulnerable to attacks on our hazmat sources. The Salinas Fire Department in cooperation with Seaside Fire Department has a OES Type 1 Hazmat team that covers Monterey and San Benito Counties. This team is also on the statewide matrix for response to greater emergencies. The team is a defensive resource.
- The City of Salinas is vulnerable to targeted acts of violence given its proximity to several military institutions (Defense Language Institute, Naval Post Graduate School), and being a hub for local gangs (Nortenos in primis). Gangs, specifically, are targeting our youths with a radicalization campaign aimed at shaping the future of the gangs while inciting our youth to violence and encouraging them to strike in the heart of our vibrant city.
- As a result of this consistent overdraft of groundwater levels in the Salinas Valley Groundwater Basin, basin levels have dropped below sea level, allowing seawater to intrude from the Monterey Bay into aquifers located 180 and 400 feet below ground surface. Drought conditions can lead to deeper and deeper groundwater pumping and this loss of groundwater increases sea water intrusion. Seawater intrusion of the 180 ft aquifer could lead to contaminated water and effect the water supply for the City of Salinas.
- Because of factors such as age, disability, income, and housing status, the population of the City of Salinas includes many residents that are vulnerable to risks associated with climate change. These risks amplify other hazards, such as severe storms, drought, and wildfire. Most of the housing stock in the City was designed for a mild climate, not for mitigating extreme heat days and other events.

J.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Salinas Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table J-17* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Hazard Mitigation Plan were reviewed and updated by the City during the planning process. *Table J-16* includes the status of actions completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table J-16
City of Salinas Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
1	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary.	Completed	All buildings meet current earthquake standards. The City has adopted the new FEMA standards. Ongoing on an as needed basis.
4	Develop an unreinforced masonry grant program that helps correct earthquake-risk nonmasonry building problems, including chimney bracing and anchoring water heaters.	Deleted	Most buildings meet current earthquake standards, and the City does not currently have the resources to implement private property grant program.
6	The police department is looking to enlarge their office space. The city is planning to build a new headquarters building on city owned property.	Completed	The City has completed the new police headquarters.
7	Work with USACE to make the wastewater treatment plant in Salinas more flood resistant.	Deleted	A more detailed and effective strategy to reduce flood risk at the industrial wastewater treatment plant is included updated 2021 actions.

Table J-17
City of Salinas Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing/ Continuous	All	Develop a sustained public outreach program that encourages consistent hazard mitigation content and develop audience-specific hazard mitigation outreach efforts. Audiences include the elderly, children, tourists, non-English speaking residents, and home and business owners.	Priority / High	Administration, Community Services, Various	HMGP and PDM Grants, General Funds
2	In Progress	Flooding	Identify and carry-out minor flood and stormwater management projects that would reduce damage to infrastructure and damage due to local flooding/inadequate drainage. These include the modification of existing culverts and bridges, upgrading capacity of storm drains, stabilization of streambanks, and creation of debris or flood/stormwater retention basins in small watersheds.	Priority / High	Maintenance	HMGP and PDM Grants
3	In Progress/ 3 years	All	Complete a written All Hazard Evacuation Plan especially for the risk of flood, dam failure, and earthquake.	Moderate	Law Enforcement/ Deputy Police Chief	General Fund
4	In Progress/ 5 years	All	Complete a written Continuity of Government Plan.	Low	Law/Fire	General Fund
5	In Progress/ 5 years	Flooding	Reinforce the Industrial Wastewater Treatment Plant against the threat of flood in the 100-year floodplain.	High	Public Works	Federal Grant Assistance
6	Ongoing	Earthquake	Continue to adopt and implement current earthquake building standards and upgrade, remove, or replace unreinforced masonry buildings, as feasible.	Medium	Community Development	Grants and General Fund
7	New	All	Update the Emergency Operations Plan and increase training for staff in ICS.	High	Law/Fire	General Fund

Table J-17
City of Salinas Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
8	New	Human-Caused	Work with neighboring jurisdictions to increase the redundancy of IT infrastructure.		Law	General Fund
9	New	Extreme Heat	Develop strategies to prepare the community to adapt to more extreme heat days. This could include creating community cooling centers, more outdoor water features (splash pads, etc.), consideration for cooling without electricity as brown outs may accompany extreme heat, and extra precautions/resources for elderly and other vulnerable residents.	Moderate	Various	Grants and General Fund
10	New (ongoing)	Drought	Coordinate with the Salinas Valley Groundwater Sustainability Agency and other water partners on reducing seawater intrusion and over drafting in local aquifers, as well as on projects which will increase groundwater recharge or increase sustainable water availability.	High	Public Works, Community Development	Grant assistance
11	New (ongoing)	Flooding	Build green infrastructure throughout the city which can protect against stormwater flooding, increase groundwater recharge, and provide other benefits through greening hardscape environments.	High	Public Works	Grants and General Fund
12	New	Climate Change	Support local community implementation of climate resiliency efforts outlined in the Monterey County Climate Resilience Plan.	Moderate	Various	Grants and General Fund
	New	Drought	Work with agriculture stakeholders on drought resiliency, water sustainability, and protecting farmworkers and crops from extreme heat.	High	Administration (Economic Development), Community Development	Grants and General Fund

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ANNEX K: CITY OF SAND CITY



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



K. CITY OF SAND CITY

K.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Chief Brian Ferrante

Chief of Police, Public Works Supervisor,
Emergency Response Coordinator

1 Pendergrass Way

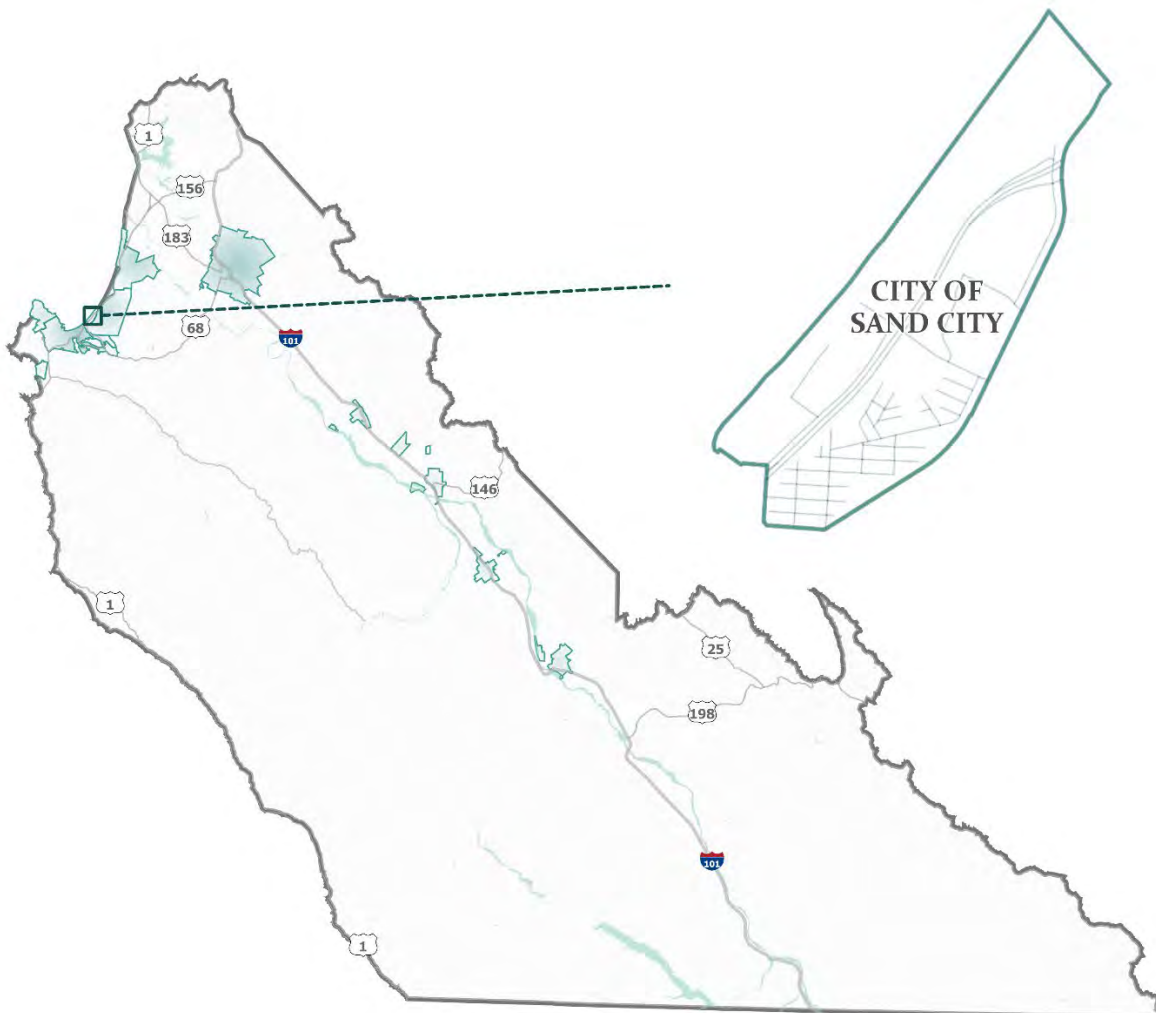
Sand City, CA 93955

(831) 394-1451 ext. 218

bferrante@sandcitypd.org

K.2 COMMUNITY PROFILE

K.2.1 LOCATION



K.2.2 GEOGRAPHY AND CLIMATE

The City of Sand City is a small City located on the Monterey Bay, and surrounded on most sides by the City of Seaside and a short distance northeast of the City of Monterey. The city has a total area of 2.9 square miles.

K.2.3 HISTORY

The City of Sand City is historically known for its industrial areas, notably coastal sand mining. Local business owners paved the way for the City's incorporation on May 31, 1960, which created the public arena for local control over the City's economic destiny and urban design. Recent history shows a steady progress toward redevelopment of the town, starting with the development of two shopping centers where there was once significant urban blight. Also, in 1996, the City reached an agreement to retain between 70 to 80% of its coastline for parks and open space, while maintaining two development areas primarily dedicated to coastal resort development which is allowed in the City's certified local coastal plan. This blending of fiscal responsibility and coastal stewardship is also reinforced by the City's ability to garner a larger percentage of property tax revenues within the redevelopment project plan area adopted in 1987. Redevelopment has given this small city the opportunity to redefine itself in a progressive, sustainable way.

K.2.4 POPULATION

The City of Sand City has a population of 334 people. The City of Sand City is the least populous city in Monterey County. While the residential population of the City is small, commercial, and industrial land uses draw an estimated daytime population of employees and shoppers that approaches 10,000.

K.2.5 GOVERNING BODY FORMAT

Sand City has a Council-Manager form of government. The Council is composed of five members elected at large to staggered terms. Councilmember terms last for four years, though the Mayoral term is only for two years. The Council appoints the City Administrator, City Attorney, and members of advisory committees. The Council chooses one of its members as Vice-Mayor, who presides at the Council meetings in the absence of the Mayor.

K.2.6 ECONOMY AND TAX BASE

Sand City has a number of industrial businesses and has served the Monterey Peninsula as a commercial base and has a number of larger retail stores. The City currently provides jobs for approximately 3,000 and attracting 40,000 to 50,000 shoppers daily to the city's businesses.

The West End area of Sand City, once an industrial area, hosts a growing artists' colony. The City of Sand City is continuously working to install public art around the City to celebrate the community, with the expressed goal to allow local and visiting artists to fully express themselves and build the foundation of an accessible public gallery. Every August, the artists of Sand City and neighboring areas hold a street fair called the "West End Celebration."

K.3 PLANNING PROCESS

The City of Sand City followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Sand City held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on August 24, 2021. Key stakeholders present at the meeting included:

- Aaron Blair, City Manager
- Brian Ferrante, Chief of Police
- Mark Parker, Public Works Supervisor

K.4 LAND USE AND DEVELOPMENT

Overtime the City of Sand City has phased-out some of the initial heavy industrial uses for regional amenities such as shopping center. The Sand City General Plan: 2002-2017 divides the City into six geographical districts. The Destination Commercial Planning District on the northeastern corner of the City, east of Highway 1, contains the largest destination commercial development on the Monterey Peninsula. Three planning districts that are east of Highway 1 and south of 7 the Destination Commercial Planning Area contain a mix of industrial and commercial uses with scattered single-family dwellings, duplexes, and small apartment units. The East Dunes Planning District includes City Hall and vacant parcels that provide an opportunity for family-oriented residential development.

In 2005, the City received unanimous coastal commission approval for a small desalination facility. This small facility allows the City to continue its redevelopment efforts without depending upon a sustainable regional water supply that has proven difficult to achieve. The City's plant uses brackish water near the coast for purifying. Following a reverse osmosis process, the byproduct water that is not potable is injected into beach wells.

Two districts along the Monterey Bay, west of Highway 1, are primarily undeveloped and planned for development as State/regional parkland or visitor serving commercial development. The Sand City coastal zone extends from the southern boundary of Fort Ord Dunes State Park to the City of Seaside on the south. Sand City has about 1.5 miles of shoreline, comprised primarily of sand dunes. In 1996, the City entered a "Memorandum of Understanding" with California State Parks and the Monterey Peninsula Regional Parks District to allow visitor-serving uses within a few remaining "development envelopes" on the coast. California State Parks and the Monterey Peninsula Regional Parks District are acquiring the remaining land for sensitive habitat reconstruction, public parks, and general open space.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The Sand City Safe Growth Survey was completed by Charles Pooler, City Planner in the City of Sand City Planning Department. The results are summarized in *Table K-1*.

Table K-1
City of Sand City Safe Growth Survey Results

Topic Area	2021	2016
Land Use	3.75	3.00
Transportation	3.67	3.67
Environmental Management	4.67	3.67
Public Safety	3.67	4.33
Zoning Ordinance	3.75	3.25
Subdivision Regulations	2.00	2.00
Capital Improvement Program & Infrastructure Policies	3.00	2.00
Building Code	4.00	5.00
Economic Development	3.00	3.00
Average Survey Ratings	3.50	3.32

K.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Sand City's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Sand City is included in this Annex.

The City of Sand City's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**.

Table K-2 displays the results of the hazard risk ranking exercise that was performed by the City of Sand City's Planning Team.

Table K-2
Threat Hazard Identification Risk Assessment (THIRA): City of Sand City

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	-	-	-	-	-	-
Coastal Erosion	2.0	3.0	2.0	2.0	9.0	Moderate
Coastal Flooding	1.0	2.0	2.0	2.0	7.0	Possible
Cyber-Attack	2.0	3.0	2.0	2.0	9.0	Moderate
Dam Failure	-	-	-	-	-	-
Drought & Water Shortage	3.0	3.0	3.0	3.0	12.0	Substantial
Earthquake	3.0	3.0	3.0	3.0	12.0	Substantial
Epidemic	3.0	3.0	2.0	2.0	10.0	Moderate
Extreme Cold & Freeze	2.0	2.0	2.0	2.0	8.0	Possible
Extreme Heat	2.0	2.0	2.0	2.0	8.0	Possible
Flash Flood	2.0	2.0	2.0	2.0	8.0	Possible
Hazardous Materials Incident	1.0	2.0	2.0	2.0	7.0	Possible
Invasive Species	-	-	-	-	-	-
Levee Failure	-	-	-	-	-	-
Localized Stormwater Flooding	2.0	2.0	2.0	2.0	8.0	Possible
Mass Migration	-	-	-	-	-	-
Pandemic	2.0	2.0	2.0	2.0	8.0	Possible
Riverine Flooding	-	-	-	-	-	-
Sea Level Rise	2.0	2.0	2.0	2.0	8.0	Possible
Severe Winter Storms	2.0	2.0	1.0	1.0	6.0	Slight
Slope Failure	2.0	1.0	1.0	1.0	5.0	Slight
Targeted Violence	2.0	2.0	2.0	2.0	8.0	Possible
Terrorism	2.0	2.0	2.0	2.0	8.0	Possible
Tsunami	2.0	2.0	2.0	2.0	8.0	Possible
Utility Interruption/ PSPS	3.0	2.0	2.0	2.0	9.0	Moderate
Water Contamination	3.0	1.0	2.0	2.0	8.0	Possible
Wildfire	-	-	-	-	-	-
Windstorms	3.0	2.0	2.0	1.0	8.0	Possible

K.5.1 AGRICULTURAL EMERGENCIES

There is no agricultural land located within the City, so therefore an agricultural emergency does not pose a direct threat. Since agriculture is a major economic driver in the County, an agricultural emergency could have indirect economic impacts on the City.

K.5.2 COASTAL EROSION

To determine coastal erosion risk, USGS Pacific Coastal and Marine Science Center Coastal Storm Modeling System (CoSMos) shoreline change, and cliff retreat projection data was used. For cliff

retreat modeling an end of century (2100) forced sea level rise amount of 200 cm was used based on Ocean Protection Council (OPC) High Risk Aversion Guidance. For shoreline change, winter erosion uncertainty modeling was used to capture the degree of uncertainty associated with future shoreline erosion. Hold the Line scenario modeling was chosen for both types of erosion. Three sea level rise levels (25 cm, 75 cm, and 200 cm) to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Table K-3 summarizes population and property exposure to coastal erosion risk.

Table K-3
Population and Property Exposed to Coastal Erosion Risk in Sand City

Sea Level Rise Scenario/ Erosion Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Cliff Erosion					
Sea Level Rise (25 cm)	0	0	\$0	0	\$0
Sea Level Rise (75 cm)	0	0	\$0	0	\$0
Sea Level Rise (200 cm)	0	0	\$0	0	\$0
Shoreline Erosion					
Sea Level Rise (25 cm)	0	0	\$0	7	\$76,930,836
Sea Level Rise (75 cm)	0	0	\$0	6	\$76,930,836
Sea Level Rise (200 cm)	0	0	\$0	1	\$70,358,090

K.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in a mapped dam inundation zone of any of the dams (Nacimiento, San Antonio, Los Padres, and Forest Lake) analyzed in this Plan.

Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

K.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic

effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

K.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 801 residential and non-residential buildings in the City, with a total value of \$352,877,451. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table K-4* summarizes population and property in the City exposed to liquefaction risk.

Table K-4
Population and Property Exposed to Liquefaction Risk in Sand City

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	0	0	\$0	11	\$76,931,932
Moderate Liquefaction Susceptibility	187	115	\$24,334,617	356	\$200,626,765

K.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table K-5* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table K-5
Population and Property Exposed to Flooding Risk in Sand City

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	0	0	\$0	22	\$76,933,577
500-Year Flood Zone	75	1	\$173,008	3	\$77,589,019

K.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances

will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table K-6 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table K-6					
Population and Property Exposed to Hazardous Materials Incident Risk in Sand City					
Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	324	157	\$32,386,952	644	\$320,490,499
Fixed Source	0	0	\$0	0	\$0

K.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

K.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

K.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip

code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts.

FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table K-7*.

Table K-7					
Annualized Frequency and Exposure to Severe Weather Events in Sand City					
Hail			Strong Wind		
Frequency (<i>Distinct Events</i>)		0.19	Frequency (<i>Distinct Events</i>)		0.03
Exposed Population		2,637	Exposed Population		2,637
Exposed Building Values		\$449,794,000	Exposed Building Values		\$449,794,000
Expected Annual Loss of Building Value		\$0	Expected Annual Loss of Building Value		\$5,030
Heat Wave			Tornado		
Frequency (<i>Event-Days</i>)		0.07	Frequency (<i>Distinct Events</i>)		0.84
Exposed Population		2,637	Exposed Population		1,750
Exposed Building Values		\$449,794,000	Exposed Building Values		\$298,534,461
Expected Annual Loss of Building Value		\$0	Expected Annual Loss of Building Value		\$5,026,212
Lightning			Winter Weather		
Frequency (<i>Distinct Events</i>)		0.38	Frequency (<i>Event-Days</i>)		0.00
Exposed Population		2,637	Exposed Population		0
Exposed Building Values		\$449,794,000	Exposed Building Values		\$0
Expected Annual Loss of Building Value		\$79	Expected Annual Loss of Building Value		\$0
Source: FEMA National Risk Index					

K.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 201 people and \$69,740,156 in building value in the City is exposed to landslide risk. Additionally, the City is not susceptible earthquake induced to landslides.

K.5.12 TSUNAMI

Population and property in the City located in a mapped tsunami inundation zone is summarized in *Table K-8*.

Table K-8					
Population and Property in Tsunami Inundation Zone in Sand City					
Inundation Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Tsunami Inundation Zone	0	1	\$152,206	88	\$76,933,577

K.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption.

K.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table K-9 summarizes population and property in the City in very high, high, and moderate fire threat areas.

Table K-9
Population and Property Exposed to Wildfire Risk in Sand City

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	0	0	\$0	0	\$0
Moderate Fire Threat	228	86	\$5,508,183	176	\$181,098,970

K.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure.

Drought, coastal and inland flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the rural economies, along with changes to agriculture and crops, which are a critical backbone of Monterey County's economic success. There will also be negative impacts to ecosystems, both on land and in the ocean, leading to local extinctions, migrations, and management challenges.

Sea level rise risk exposure in the City was calculated based on the NOAA Office for Coastal Management [sea level rise viewer](#) projections. Three sea level rise levels (25 cm, 75 cm, and 200 cm) were chosen to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Population and property exposed to sea level rise risk is summarized in *Table K-10*.

Table K-10
Population and Property Exposed to Sea Level Rise in Sand City

Sea Level Rise Amount	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
1 ft Sea Level Rise (2030)	0	0	0	10	\$76,931,932
3 ft Sea Level Rise (2060)	0	0	0	13	\$76,931,932
7 ft Sea Level Rise (2100)	0	0	0	17	\$76,933,577

K.6 CAPABILITY ASSESSMENT

The City of Sand City performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table K-11*
- An assessment of administrative and technical capabilities is presented in *Table K-12*
- An assessment of fiscal capabilities is presented in *Table K-13*
- An assessment of education and outreach capabilities is presented in *Table K-14*
- Classifications under various community mitigation programs are presented in *Table K-15*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section K.6.1 in *Table K-16*
- An overall self-assessment of capability is presented in Section K.6.2 in *Table K-17*

Table K-11
Planning and Regulatory Capability

Document	Department	Comments
Planning Documents		
General Plan	☒ • Community Development	
Capital Improvement Plan	☒ • Administration Department	Under continuous modification as situations/ priorities arise
Floodplain Management Plan	☒ • FEMA	
Open Space Management Plan	☐ •	
Stormwater Management Plan	☒ • Community Development	
Coastal or Shoreline Management Plan	☒ • Community Development	The City has a certified Local Coastal Program
Local Coastal Program	☒ • Community Development	Certified 1984
Climate Action/ Adaptation Plan	☐	
Emergency Operations Plan	☒ • Police Department	
Continuity of Operations Plan	☐	
Community Wildfire Protection Plan	☐	
Evacuation Plan	☐	
Disaster Recovery Plan	☐	

Table K-11
Planning and Regulatory Capability

Document		Department	Comments
Economic Development Plan	☐		
Historic Preservation Plan	☐		
Transportation Plan	☐		
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	• Community Development	Sand City Municipal Code 18.88
Zoning Ordinance	☒	• Community Development	
Subdivision Ordinance	☒	• Community Development	
Site Plan Review Requirements	☒	• Community Development	
Unified Development Ordinance	☐		
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐		
Building Code	☒	• Community Development	
Fire Prevention Code	☒	• Community Development	

Table K-12
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	• Community Development	Planner- City Employee Engineer- Contract with Harris & Associates
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	• Community Development	Engineer- Contract with Harris & Associates
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	• Community Development	Planner- City Employee Engineer- Contract with Harris & Associates
Building Inspector	☒	• Community Development	Plan check and inspection service via contract with City of Monterey and 4-leaf
Emergency Manager	☒	• Administration Department	
Floodplain Manager	☒	• Community Development	Community Development Director assigned Floodplain Administrator per municipal code 18.88
Land Surveyors	☒	• Community Development	City Surveyor- Contract with Polaris Consulting

Table K-12
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Resource development staff or grant writers	☐		
Public Information Officer	☒	• Administration Department	City Mayor in conjunction with City Manager
Scientist(s) familiar with the hazards of the community	☐		
Staff with education or expertise to assess the community's vulnerability to hazards	☐		
Personnel skilled in Geographic Information Systems (GIS)	☐		
Maintenance programs to reduce risk	☒	• Public Works	City Public Works crew consists of 3 employees
Warning systems/services	☐		
Mutual Aid Agreements	☒	• Police Department	Agreement with Monterey County Sheriff

Table K-13
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	• Administration Department	If funds are available and not committed, can be used for hazard mitigation
Capital Improvements Project Funding	☒	• Administration Department	Funded through General Fund
Special Purpose Taxes	☒		Eligible, but subject to voter approval
Stormwater Utility Fees	☐		
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☐		Connection fees collected by regional agencies, not City
Development Impact Fees	☒		City has a "Building Development Fee" for street work only
General Obligation Bonds	☒		
Special Tax and Revenue Bonds	☒		
Community Development Block Grants (CDBG)	☒		

Table K-14
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☐	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☐	
Natural disaster or safety related school programs	☐	No schools are located in the City.
Public-private partnership initiatives addressing disaster-related issues	☐	

Table K-15
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	Yes	2	6/17/2015
<i>StormReady</i> Certification	No	-	-
<i>TsunamiReady</i> Certification	No	-	-
<i>Firewise Communities</i> Certification	No	-	-

K.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table K-17
National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Aaron Blair, Community Development Director/ City Manager
NFIP Community Number:	060435
Flood Insurance Policies in Force:	3
Insurance Coverage in Force:	\$1,400,000
Written Premium in Force:	\$3,109
Total Loss Claims:	0
Total Payments for Losses:	0
Adopted Regulations that meet NFIP Requirements:	
• Sand City Municipal Code (SCMC) Chapter 18.88 "Flood Protection." Adopted by Ordinance 96-01 (June 4, 1996) and last updated by Ordinance 00-03 (December 5, 2000)	
Date of last NFIP Community Assistance Visit (CAV):	

Table K-17
National Flood Insurance Program (NFIP) Compliance

Date of last visit unknown. Unaware of past compliance issues.

Higher standards that exceed minimum NFIP requirement:

None.

Additional floodplain management provisions:

None.

Floodplain management activities performed that go beyond FEMA minimum requirements:

None

Existing impediments to running an effective NFIP program:

None identified.

Specific actions that are ongoing or considered related to continued compliance with the NFIP:

- Maintain updates to City Municipal Code for continued compliance.
- Maintain and update map of areas of potential frequent flooding during severe storm events.
- Translate hard copy of flood maps to digital and post on City website (public outreach and education).
- Encourage Certified Floodplain Manager (CFM) Certification.
- Continue to maintain supply of FEMA Floodplain maps at City Hall for staff and public reference.

K.6.2 SELF-ASSESSMENT OF CAPABILITY

Table K-18
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Limited
Fiscal Capability	Limited
Education and Outreach Capability	Limited
Political Capability	Moderate
Overall Capability	Limited

K.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Overall capabilities can be improved through mutual aid and cooperation with neighboring cities that have a wider range of resources and staff capabilities. Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

K.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans

- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

K.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Sand City Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Sand City are identified below:

- The City's existing drainage system is deemed inadequate for conveying stormwater during heavy rainfall events with several known problem areas. Of primary concern is the vicinity of Redwood Avenue at John Street, one of the lowest points in the city (approximately 4 feet below sea level) which has experienced past flood events that have inundated streets and nearby commercial properties. Other areas of concern include John Street at Ortiz Avenue and near the intersection of Ortiz Avenue at Contra Costa Street.
- The City of Seaside's 90" outfall at the end of Bay Avenue continues to get plugged by shifting sands, preventing drainage of stormwater runoff from Seaside and Sand City, and contributing regularly (multiple times per year) to stormwater flooding at John Street and Ortiz Avenue. The City of Seaside maintains the channel during storm events to prevent flooding, and as long as this maintenance program continues this area is not a major hazard risk.
- Heavy drought conditions increase salinity factor of water extracted from aquifer for the City's desalination plant; resulting in a shutdown of the desalination plant due to the resulting higher salinity brine that cannot be put back into the aquifer. Drilling new wells further inland are anticipated to resolve this issue during times of severe drought as well as provide operational redundancy.

- Several elevated storage tanks used for acid baths at Granite Rock (Dias Street) currently store an estimated 2,000+ gallons that may potentially be damaged or cause overflow/flood issues following an earthquake and local ground-shaking event.
- While the city's population is low, it becomes one of the most densely populated areas in Monterey County during the daytime due to its two regional commercial shopping centers (Sand Dollar and Edgewater), creating a major warning and evacuation concern for the City.
- The Monterey Regional Water Pollution Control Agency (MRWPCA) operates a sewer pump station at West Bay Street in Sand City. This facility is located close to the shoreline and is potentially susceptible to tsunamis. Furthermore, there is a 36-inch force main that extends from this pump station north along the west side of Highway 1 to the treatment plant in the City of Marina. Both the pump station and this 36-inch force main are susceptible to earthquakes. Damage to one or both of these facilities would have far reaching impacts to the sewer service of the Monterey Peninsula community, in addition to potential spills and contamination. The pump station and pipelines are the property and jurisdiction of the MRWPCA, and thus maintenance and repair are that Agency's responsibility. However, during an emergency whereby the plant and/or infrastructure is damaged, the City of Sand City would be the immediate emergency responder for that infrastructure within Sand City's boundaries.

K.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Sand City Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table K-20* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table K-19* includes the status of action previous plan completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table K-19
City of Sand City Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
1	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary	Completed	Completed
5	Maintain records and data to accurately reflect existing utilities and critical facilities.	Completed	Completed
7	Continue to implement the most recent versions of the California State-adopted construction and building codes.	Completed / Ongoing	Completed and ongoing as when building code updates are released.
8	Improve and expand the City's website to include the disbursement of hazard related information to the general public, inclusive of mitigation measures.	Completed	The City recently completed a full update of their website.
9	Promote information sharing among neighboring cities, utilities, Monterey County, and State and Federal agencies.	Completed / Ongoing	Completed and ongoing as needed.
11	Explore mitigation opportunities for repetitively flooded properties and, if necessary, encourage property owners to carry-out acquisition, relocation, elevation, and flood-proofing measures to protect these properties.	Completed	Capital project in progress that will address major flooding issues.
12	Ensure that new developments are designed to reduce or eliminate flood by requiring properties and rights-of-way to be designed for the approved sewer and drainage facilities, providing onsite detention facilities whenever possible.	Completed / Ongoing	Completed and ongoing as needed in development review process.
13	Continue to conduct current fuel management programs (weed abatement programs) and investigate and apply new and emerging fuel management techniques.	Complete/ Ongoing	Completed and ongoing as needed.
16	MRWPCA sewer pump station and force main are vulnerable to tsunami and earthquake damage. This infrastructure, though located within Sand City, is the jurisdiction of another government agency. The City can contact the MRWPCA to see if they have emergency plans in place for such disasters.	Completed	The City of Seaside removed the pump station and installed a larger sewer main.

Table K-20
City of Sand City Hazard Mitigation Action Plan Matrix

Action #	Status/Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	In Progress/ Ongoing	Severe Weather, Utility Interruption, Earthquake	Replace above-ground utility lines with underground utility lines. Ensure that utility lines are installed underground for new construction. This includes completing the undergrounding of utilities on California Avenue between Tioga Avenue and East Avenue and on Tioga Ave. between California Avenue and Metz Road.	Priority / High	Building and Engineering	General Funds
2	In Progress/ 1-2 years	Drought	Drill two new groundwater wells further inland in order to draw in more brackish water to the desalination plant. This will mitigate the salinity of water extracted from aquifer for the City's desalination plant that can result in a shutdown of the desalination plant due to the resulting higher salinity brine that cannot be put back into the aquifer.	Priority / High	Engineering and Planning	Partnership with Cal-Am Water
3	In Progress	Flooding	Complete Contra Costa and Catalina Stormwater Improvement Projects to mitigate flood risk.	Priority / High	Building and Engineering	Grants and General Funds
4	Ongoing/ Continuous	All	Continue to use the City's website and social media to share relevant hazard preparedness and mitigation information.	Moderate	Administration	General Funds
5	New/ 0-5 years	All	Update the General Plan and include relevant hazard information.	Moderate	Planning	General Funds

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ANNEX L: CITY OF SEASIDE



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



L. CITY OF SEASIDE

L.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

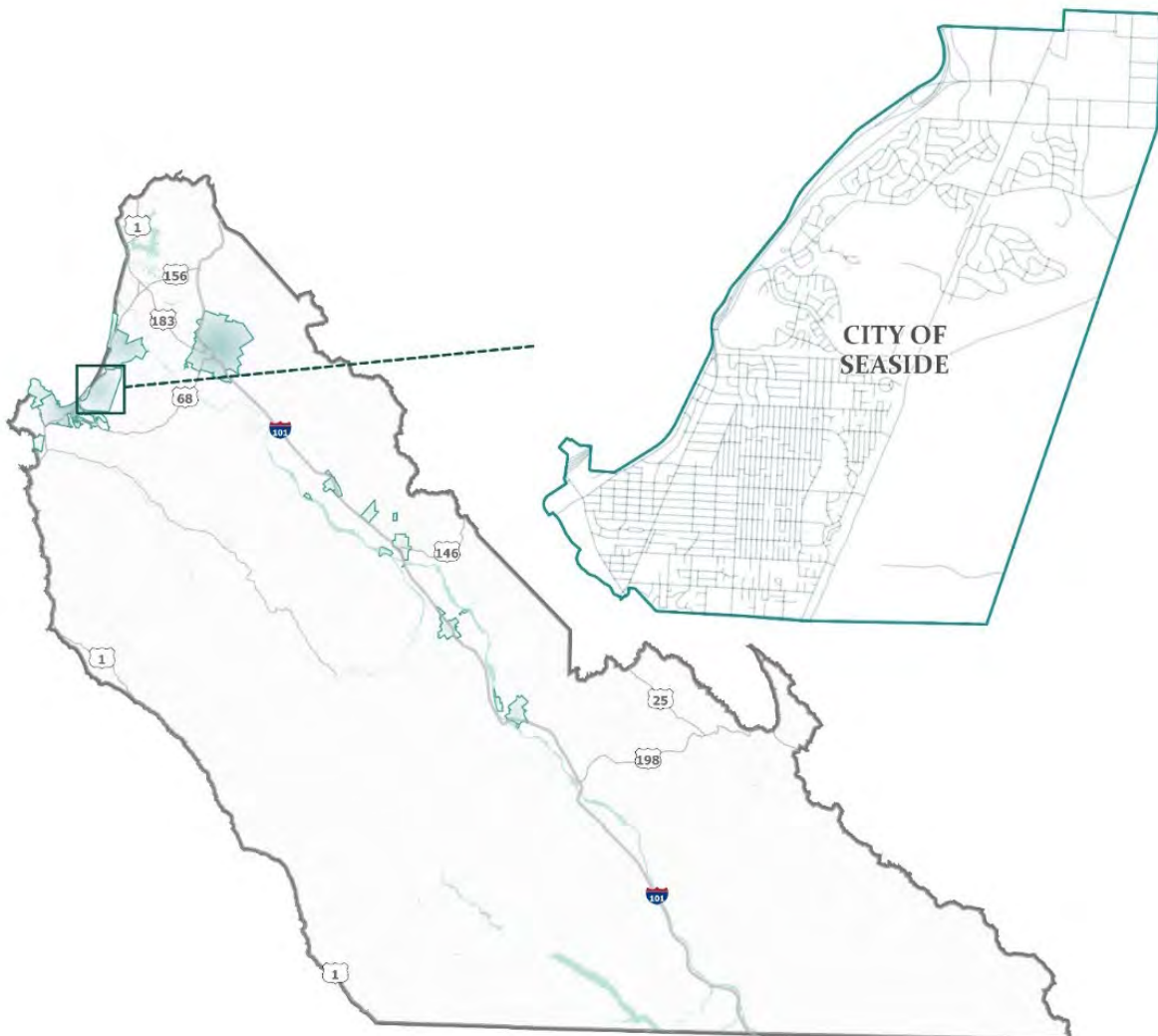
Division Chief David Nava
Seaside Fire Department
1635 Broadway Ave.
Seaside, CA 93955
(831) 899-6790
DNava@ci.seaside.ca.us

Alternate Point of Contact

Fire Chief Mary Gutierrez
Seaside Fire Department
1635 Broadway Ave.
Seaside, CA 93955
(831) 899-6790
MGutierrez@ci.seaside.ca.us

L.2 COMMUNITY PROFILE

L.2.1 LOCATION



L.2.2 GEOGRAPHY AND CLIMATE

The City of Seaside is the largest city on the Monterey Peninsula, and second largest in Monterey County. Seaside is a family-oriented community with a full range of housing, business, cultural, and recreational opportunities in a safe and attractive environment for residents and visitors. Seaside is home to California State University at Monterey Bay and the Monterey College of Law, both located on the former site of Fort Ord. The climate is a cool Mediterranean type, strongly influenced by the prevailing winds from the west, which blow over the Pacific Coast's cool ocean currents from Alaska.

L.2.3 HISTORY

Seaside began as the Hotel Del Monte began, as a part of the City of Monterey. Because the subdivision of Seaside was located just a mile to the northwest of the hotel, the subdivision of Seaside was initially conceived as an outgrowth of the resort community and identified as a tourist destination. Like many other ambitious pioneers in the late nineteenth century, Seaside's founder, Dr. John Roberts left New York in 1887 for California and settled near relatives in Pacific Grove. He and his uncle bought 160 acres from the David Jacks Corporation, which he divided into 1,000 lots for sale as vacation property. He also made his home in the new residential area that bordered Monterey and the Hotel.

In 1910, a Monterey County Supervisor successfully lobbied to locate the US Army Base Fort Ord in Seaside. This base housed over 20,000 infantry members and civilian workers. Fort Ord was considered one of the most attractive locations of any US Army post, because of its proximity to the beach and California weather. Due to Base Realignment and Allocation Closures, Fort Ord was closed in 1994. Since that time, the land has been conveyed to different government and nonprofit organizations for development and preservation of open space. Seaside thrived as a center of diversity derived from its multicultural character as a military town throughout the decades of the twentieth century and became known as a forward-thinking model of political inclusion during the civil rights era.

L.2.4 POPULATION

The City of Seaside has a population of 32,366 people (2020 Census), a small decrease (2%) since 2010. The population is projected to continue to grow modestly.

L.2.5 GOVERNING BODY FORMAT

The City of Seaside is a General Law City with a Council/Manager form of government. The five-member City Council is a legislative and policy-making body. The Mayor is elected every two years in a general election. Serving with the Mayor are four members of the City Council who have overlapping terms; every two years, two members of the City Council are elected in a general election. Members of the City Council, including the Mayor, are not subject to term limits. The City Manager is appointed by the City Council to manage the daily operations of the City and is responsible for making policy recommendations to the City Council and implementing City Council policy directives.

L.2.6 ECONOMY AND TAX BASE

While the foundation of the Seaside business community is made up of small family-owned establishments, the area hosts national retailers and restaurant groups as well as the Seaside Auto Center, one of the first auto malls in the country.

L.3 PLANNING PROCESS

The City of Seaside followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Seaside held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on June 28, 2021. Key stakeholders present at the meeting included:

- Craig Malin, City Manager
- Chief Mary Gutierrez, Fire Chief
- Chief Dave Nava, Division Chief, EOC Planning
- Sheri Damon, City Attorney
- Chief Abdul D. Pridgen, Chief of Police
- David Little, Chief Building Official
- Nisha Patel, Public Works Director and City Engineer
- Dave Fortune, Maintenance and Utilities Superintendent
- Roberta Greathouse, HR Director / Risk Manager
- Trevin Barber, Assistant City Manager, Economic Development and Community Planning Director
- Dan Meewis, Recreation Director
- Gary Bartlett, IT Manager
- Haroon Noori, Admin. Analyst
- Victor Damiani, Finance Director

L.4 LAND USE AND DEVELOPMENT

Traditionally a military town linked to Fort Ord, which closed in 1994, the city has experienced significant redevelopment and gentrification in recent years with projects ranging from golf courses, five-star resorts, conference facilities, new residential and commercial development, and plans for a mixed-use, transit-oriented, urban village that would transform the downtown.

The City of Seaside is in the processes of updating its General Plan and a full draft has been completed. Approximately one-third of the total City land area is occupied by residential uses, the majority of which is single family or duplex housing. The former Fort Ord land for conservation at just under one-quarter of the total land area in the City. The former Fort Ord lands that are planned for growth are about 16% of the total (about 830 developable acres of land). Public lands account for about one-quarter of the total and commercial and industrial uses account for just 4% of the total land area of the City. Seaside has a unique urban form that includes established single-family residential areas and commercial corridors in the historic part of the City and vacant land and buildings in the former Fort Ord that will be converted to urban uses over time. The City's core residential neighborhoods have a high building density, with minimal setbacks, while newer subdivisions have a more suburban building layout, with larger yards and less regular building placement. Most of the City's commercial districts are developed in a strip commercial development style

The Seaside coastal zone includes about 90 acres of land and 500 feet of shoreline. A former estuarine complex comprised of Robert's Lake and Laguna Grande makes up the vast inland portion of the coastal zone. Land uses within the coastal zone include residential, commercial, and park/open space. The Local Coastal Program was certified in 2013.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The Seaside Safe Growth Survey was completed by Gloria Stearns, Community Development Director for the City of Seaside Community Development Department. The results are summarized in *Table L-1*.

Table L-1
City of Seaside Safe Growth Survey Results

Topic Area	2021	2016
Land Use	4.25	4.25
Transportation	4.67	4.33
Environmental Management	3.67	3.67
Public Safety	4.33	3.67
Zoning Ordinance	3.75	4.75
Subdivision Regulations	2.00	3.00
Capital Improvement Program & Infrastructure Policies	3.00	2.33
Building Code	4.00	5.00
Economic Development	4.00	4.00
Average Survey Ratings	3.74	3.89

L.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Seaside's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Seaside is included in this Annex.

The City of Seaside's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table L-2* displays the results of the hazard risk ranking exercise that was performed by the City of Seaside's Planning Team.

Table L-2
Threat Hazard Identification Risk Assessment (THIRA): City of Seaside

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	1.2	1.2	1.3	1.2	4.9	Slight
Coastal Erosion	2.4	2.4	2.3	2.3	9.4	Moderate
Coastal Flooding	2.6	2.6	2.6	2.9	10.7	Substantial
Cyber-Attack	3.5	3.2	3.3	3.5	13.5	High
Dam Failure	1.1	1.1	1.1	1.1	4.4	Slight
Drought & Water Shortage	3.4	3.3	3.4	3.5	13.6	High
Earthquake	2.8	3.1	3.0	2.9	11.8	Substantial
Epidemic	3.2	3.0	3.1	3.1	12.4	High
Extreme Cold & Freeze	1.8	1.8	1.8	1.8	7.2	Possible
Extreme Heat	2.0	2.0	2.0	1.9	7.9	Possible
Flash Flood	2.1	2.3	2.3	2.5	9.2	Moderate
Hazardous Materials Incident	2.2	2.4	2.4	2.4	9.4	Moderate
Invasive Species	2.3	2.2	2.2	2.1	8.8	Moderate
Levee Failure	1.2	1.3	1.2	1.3	5.0	Slight
Localized Stormwater Flooding	2.7	2.8	2.4	2.8	10.7	Substantial
Mass Migration	1.3	1.3	1.1	1.1	4.9	Slight
Pandemic	3.0	2.8	2.5	2.9	11.1	Substantial
Riverine Flooding	1.3	1.4	1.5	1.4	5.7	Slight
Sea Level Rise	2.5	2.8	2.7	2.6	10.6	Substantial
Severe Winter Storms	2.2	2.4	2.2	2.2	9.1	Moderate
Slope Failure	1.9	2.1	1.9	2.1	8.0	Possible
Targeted Violence	2.7	2.6	2.7	2.8	10.7	Substantial
Terrorism	2.1	2.4	2.3	2.8	9.5	Moderate
Tsunami	2.4	2.4	2.6	2.6	10.0	Moderate
Utility Interruption/ PSPS	2.8	2.9	2.4	2.6	10.7	Substantial
Water Contamination	2.3	2.0	2.6	2.6	9.4	Moderate
Wildfire	2.8	3.1	3.3	3.3	12.4	High
Windstorms	2.8	2.8	2.7	2.7	10.9	Substantial

L.5.1 AGRICULTURAL EMERGENCIES

There is no agricultural land located within the City, so therefore an agricultural emergency does not pose a direct threat. Since agriculture is a major economic driver in the County, an agricultural emergency could have indirect economic impacts on the City.

L.5.2 COASTAL EROSION

To determine coastal erosion risk, USGS Pacific Coastal and Marine Science Center Coastal Storm Modeling (CoSMos) shoreline change, and cliff retreat projection data was used. For cliff retreat modeling an end of century (2100) forced sea level rise amount of 200 cm was used based on the Ocean Protection Council (OPC) High Risk Aversion Guidance. For shoreline change, winter erosion uncertainty modeling was used to capture the degree of uncertainty associated with future shoreline erosion. Hold the Line scenario modeling was chosen for both types of erosion. Three sea level rise levels (25 cm, 75 cm, and 200 cm) to represent planning horizons based on OPC Sea Level Rise Projections for the Monterey Tide Gauge. 25 cm of sea level rise represents near term (2030) risk, 75 cm represent mid-term (2060) risk, and 200 cm represent long-term (2100) risk.

Table L-3 summarizes population and property exposure to coastal erosion risk.

Table L-3 Population and Property Exposed to Coastal Erosion Risk in Seaside					
Sea Level Rise Scenario/ Erosion Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Cliff Erosion					
Sea Level Rise (25 cm)	0	0	\$0	0	\$0
Sea Level Rise (75 cm)	0	0	\$0	0	\$0
Sea Level Rise (200 cm)	0	0	\$0	0	\$0
Shoreline Erosion					
Sea Level Rise (25 cm)	0	0	\$0	0	\$0
Sea Level Rise (75 cm)	0	0	\$0	0	\$0
Sea Level Rise (200 cm)	0	0	\$0	0	\$0

Much of the City lies approximately 2,000 feet inland from the coastline, which provides sufficient distance and protection from coastal erosion risk. Sea level rise and erosion modeling is inherently uncertain, and therefore future modeling could identify people and property at risk to coastal erosion. Sea level rise could worsen flooding in existing flood hazard areas and could also impact the area north of Broadway Avenue along Del Monte Boulevard. Miles of transportation infrastructure, beaches, recreation areas, and homes and businesses may be at risk to damage from sea level rise and coastal flooding. The City could also be impacted by other types of erosion not profiled in this Plan.

L.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in a mapped dam inundation zone of any of the dams (Nacimiento, San Antonio, Los Padres, and Forest Lake) analyzed in this Plan.

Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic impact.

L.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution. A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

L.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk. Major highways and bridges would be major critical facility of concern if an earthquake were to occur. Seaside lies in one of three areas that have the highest susceptibility to ground shaking in the County. Approximately 93% of the City's resident households and a number of critical facilities, highways, and bridges are located in a high shaking hazard area. Strong ground shaking due to earthquakes can cause soils to compact, resulting in local or regional settlement of the ground surface. This settlement can cause moderate to heavy damage to structures and underground utility lines in Seaside.

According to Monterey County Assessor records, there are 7,620 residential and non-residential buildings in the City, with a total value of \$2,826,808,392. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events. Additionally, liquefaction risk was assessed. *Table L-4* summarizes population and property in the City exposed to liquefaction risk.

Table L-4
Population and Property Exposed to Liquefaction Risk in Seaside

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	115	0	\$0	47	\$56,085,622
Moderate Liquefaction Susceptibility	49	0	\$0	20	\$18,994,571

The majority of Seaside has low relative liquefaction susceptibility, with the beach area of the City having moderate susceptibility. The southern portion of Seaside, near Roberts Lake and Laguna Grande Lake, has moderate, high, and/or variable liquefaction risk.

L.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. The City is susceptible to flooding, particularly in a small coastal area west of Highway 1, and additional areas adjacent to Roberts Lake, Laguna Grande, and associated drainage areas. These areas are subject to a one-percent-annual-chance-flood, also referred to as a 100-year flood zone. The rest of the City is in a 500-year flood zone and is subject to a zero point two-percent (0.2 percent) chance-flood event. *Table L-5* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table L-5
Population and Property Exposed to Flooding Risk in Seaside

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	0	0	\$0	25	\$47,811,746
500-Year Flood Zone	25,549	5,461	\$2,345,735,210	2,106	\$460,720,029

L.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility. *Table L-6* summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table L-6
Population and Property Exposed to Hazardous Materials Incident Risk in Seaside

Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	22,109	3,485	\$1,543,482,883	1,745	\$452,468,201
Fixed Source	0	0	\$0	0	\$0

As cities age, land uses associated with hazardous materials are often abandoned. These uses include former industrial properties, gasoline stations, and military sites. Uses such as this may have soils and groundwater that are contaminated and are often referred to as “brownfields.” Seaside has a number of hazardous waste sites located largely in the southwestern part of the City, as well as underground storage tanks located in the northeastern part of the City. Of the hazardous waste sites in Seaside, there is one Federal Superfund site, located on former Fort Ord lands, and two state response sites that have land use restrictions. Throughout the City, there are seven open or active cleanup sites (including leaking underground storage tank (LUST) sites), in addition to 28 closed LUST cases.

The Fort Ord Superfund Site was added to the Superfund National Priorities List of Hazardous Waste Sites on February 21, 1990. While most of the former Fort Ord is now part of the Fort Ord National Monument, much of the area located in Seaside has been or will be converted from military to civilian land uses. While many old military buildings and infrastructure remain abandoned, others have been demolished. Hazardous materials and toxic waste sites at the former Fort Ord consist of a wide variety of materials including industrial chemicals, petrochemicals, domestic and industrial wastes (as seen in landfills), asbestos and lead-based paint in buildings, above- and underground storage tanks, artillery and explosives.

The identification, remediation, and disposal of hazardous waste associated with the Superfund cleanup process of Fort Ord takes place under the Federal Facilities Agreement (FFA). The US Army is responsible for conducting the Superfund cleanup process, and the US EPA is the lead agency for regulatory enforcement and oversight of Superfund activities. Remnant safety hazard issues are also present on the former Fort Ord resulting from previous U.S. Army munitions training operations. In 2007, a remediation program was created to provide coordinated access for bikers, hikers, runners, and equestrians to the new Fort Ord National Monument

L.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

L.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the COVID-19 virus have impacted the whole population of the City, specifically vulnerable populations.

L.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in

poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts. FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table L-7*.

Table L-7
Annualized Frequency and Exposure to Severe Weather Events in Seaside

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.27	Frequency (<i>Distinct Events</i>)	0.06
Exposed Population	22,668	Exposed Population	22,668
Exposed Building Values	\$1,665,961,000	Exposed Building Values	\$1,665,961,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$70
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	0.08	Frequency (<i>Distinct Events</i>)	1.09
Exposed Population	22,668	Exposed Population	22,668
Exposed Building Values	\$1,665,961,000	Exposed Building Values	\$1,665,961,000
Expected Annual Loss of Building Value	\$1	Expected Annual Loss of Building Value	\$31,131,774
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.41	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	22,668	Exposed Population	0
Exposed Building Values	\$1,665,961,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$305	Expected Annual Loss of Building Value	\$0

Source: FEMA National Risk Index

L.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 3,296 people and \$305,007,976 in building value in the City is exposed to landslide risk. Additionally, the City is not susceptible earthquake induced to landslides.

Seaside has low susceptibility to landslides, as it lacks hills and steep bluffs. However, landslides and surficial slope failure are most likely to occur in areas with a slope greater than 25% and along steep bluffs. Extensive areas in the southeastern portion of the City have slopes in excess of 30%. Certain areas have slopes approaching vertical. Development is limited in these areas because of the severe erosion and landslide hazard that exists.

L.5.12 TSUNAMI

Population and property located in a mapped tsunami inundation zone is summarized in *Table L-8*.

Table L-8
Population and Property in Tsunami Inundation Zone in Seaside

Inundation Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Tsunami Inundation Zone	49	0	\$0	36	\$51,541,447

Much of the City of Seaside lies approximately 2,000 feet inland from the coastline, which should provide sufficient distance and protection from tsunamis.

L.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption.

L.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table L-9 summarizes population and property in the City in very high, high, and moderate fire threat areas.

Table L-9
Population and Property Exposed to Wildfire Risk in Seaside

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	0	\$0
High Fire Threat	3,764	14	\$14,211,519	36	\$742,995
Moderate Fire Threat	10,121	183	\$141,599,152	180	\$56,893,553

The undeveloped areas in the northern and eastern portions of the City are highly prone to wildland fires. These areas contain grassland with many steeper areas with brushland and wooded slopes. The State of California Department of Forestry rates these areas as extreme wildfires hazard areas based on slope characteristics, climate, fuel loading, and water availability. These areas could create safety hazards for residents within the community.

L.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards.

Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure. Drought, coastal and inland flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the rural economies, along with changes to agriculture and crops, which are a critical backbone of Monterey County's economic success. There will also be negative impacts to ecosystems, both on land and in the ocean, leading to local extinctions, migrations, and management challenges.

L.6 CAPABILITY ASSESSMENT

The City of Seaside performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table L-10*
- An assessment of administrative and technical capabilities is presented in *Table L-11*
- An assessment of fiscal capabilities is presented in *Table L-12*
- An assessment of education and outreach capabilities is presented in *Table L-13*
- Classifications under various community mitigation programs are presented in *Table L-14*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section L.6.1 in *Table L-15*
- An overall self-assessment of capability is presented in Section L.6.2 in *Table L-16*

Table L-10
Planning and Regulatory Capability

Document	Department	Comments
Planning Documents		
General Plan	☒ • Community Development	Update to General Plan estimated for adoption in 2022.
Capital Improvement Plan	☒ • Engineering	
Floodplain Management Plan	☐ • Engineering	
Open Space Management Plan	☒ • Public Works	
Stormwater Management Plan	☐ • Engineering	
Coastal Management Plan	☒ • Community Development	
Local Coastal Program	☒ • Community Development	The LCP was certified in 2013
Climate Action/ Adaptation Plan	☐ • Community Development	The City will hire a consultant in 2022 to complete this work.
Emergency Operations Plan	☒ • Fire Department	
Continuity of Operations Plan	☒ • Fire Department	
Community Wildfire Protection Plan	☐	
Evacuation Plan	☒ • Fire Department • Police Department	Currently merging plan with County's plan
Disaster Recovery Plan	☒ • Fire Department	Part of EOP

Table L-10
Planning and Regulatory Capability

Document		Department	Comments
Economic Development Plan	☒	- Community Development - Economic Development	Economic Opportunity Plan (General Plan also has related strategies and policies)
Historic Preservation Plan	☐		The City has no historic buildings or designations.
Transportation Plan	☒	TAMC	
Codes, Ordinances & Requirements			
Floodplain Ordinance	☒	Engineering	Seaside Municipal Code - Chapter 15.28 Flood Control
Zoning Ordinance	☒	Community Development	SMC 17. As part of General Plan update, zoning code is being updated.
Subdivision Ordinance	☒	Community Development	SMC 16
Site Plan Review Requirements	☒	- Community Development - Public Works - Building Department	
Unified Development Ordinance	☐		
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐		
Building Code	☒	Building Department	
Fire Prevention Code	☒	Fire Department	

Table L-11
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	- Community Development - Public Works - Engineering	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	- Engineering - Public Works - Building Department	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	- Community Development - Engineering - Public Works	
Building Inspector	☒	Building Department	
Emergency Manager	☒	Fire Department	
Floodplain Manager	☒	Engineering	

Table L-11
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Land Surveyors	☐	
Resource development staff or grant writers	☒ - Community Development - Public Works - Engineering	
Public Information Officer	☒ • City Manager Department	
Scientist(s) familiar with the hazards of the community	☐	
Staff with education or expertise to assess the community's vulnerability to hazards	☒ - Community Development - Engineering - Fire Department - Building Department	
Personnel skilled in Geographic Information Systems (GIS)	☒ - Community Development - Engineering	
Maintenance programs to reduce risk	☒ • Public Works	
Warning systems/services	☒ • Monterey County	
Mutual Aid Agreements	☒ - Police Department - Fire Department	PD, Fire has agreement with County for Mutual Aid
Other	Environmental Services Cooperative Agreement (ESCA): this is a long-term implementation grant agreement from the Army. Under this grant, the City is responsible for the long term implementation and monitoring of land use controls that have been put in place, across more than 3300 acres of the former Fort Ord, to address residual safety issues that remain now that the cleanup of munitions has been completed. Land that has been cleared of munitions for their designated reuse has been transferred to the City of Seaside, the City of Del Rey Oaks, the City of Monterey, California State University, Monterey Bay (Marina), and the County of Monterey.	

Table L-12
Fiscal Capability

Fiscal Resources	Department	Comments
General Funds	☒ - Engineering - Public Works	
Capital Improvements Project Funding	☒ - Engineering - Public Works	
Special Purpose Taxes	☒	If measure is introduced and passes
Stormwater Utility Fees	☐	Under consideration

Table L-12
Fiscal Capability

Fiscal Resources		Department	Comments
Gas / Electric Utility Fees	☒	• Finance	Directed to general fund
Water / Sewer Fees	☒	• Finance	Special District
Development Impact Fees	☐		
General Obligation Bonds	☒	• Finance	For special specific projects
Special Tax and Revenue Bonds	☒	• Finance	For special specific projects
Community Development Block Grants (CDBG)	☐	• Community Development	City of Seaside gets CDBG, CDBG-CV3 funds, but not CDBG-MIT currently

Table L-13
Education and Outreach Capability

Educational and Outreach Resources		Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒	• Community Development • Fire Department	Community Development has contacts for various nonprofits that may be of assistance. Fire Department provides emergency preparedness
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒	• Police Department • Fire Department • Community Development • Engineering	Participation in community events. Fire Department Open House, Sustainable Seaside non-profit Earth Day event, National Night Out.
Natural disaster or safety related school programs	☐		
Public-private partnership initiatives addressing disaster-related issues	☐		

Table L-14
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification	Yes	2	
<i>StormReady</i> Certification	Yes		
<i>TsunamiReady</i> Certification	No	-	-
<i>Firewise Communities</i> Certification	No	-	-

L.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table L-15

National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Nisha Patel, Public Works Director/City Engineer
NFIP Community Number:	060203
Flood Insurance Policies in Force:	10
Insurance Coverage in Force:	\$2,789,000
Written Premium in Force:	\$3,748
Total Loss Claims:	2
Total Payments for Losses:	\$125,032
Adopted Regulations that meet NFIP Requirements:	
Seaside Municipal Code - Chapter 15.28 Flood Control last revised by Ordinance 744 adopted July 21, 1988.]	
Date of last NFIP Community Assistance Visit (CAV):	
Unknown.	
Higher standards that exceed minimum NFIP requirement:	
- California Building Codes - Regulations that require no use of fill for structural support of buildings - Within Zone E on the Flood Insurance Rate Map, a setback is required for all new development from the ocean, lake, bay, riverfront or other body of water to create a safety buffer consisting of a natural vegetative or contour strip. This buffer shall be designated according to the flood-related erosion hazard and erosion rate, in relation to the anticipated “useful life” of structures, and depending upon the geologic, hydrologic, topographic, and climatic characteristics of the land. The buffer may be used for suitable open space purposes, such as for agricultural, forestry, outdoor recreation, and wildlife habitat areas, and for other activities using temporary and portable structures only.	
Additional floodplain management provisions:	
- Seaside Municipal Code Chapter 8.46, Urban Storm Water Quality Management and Discharge Control - Seaside Municipal Code Chapter 15.32, Standards to Control Excavation, Grading and Erosion	
Floodplain management activities performed that go beyond FEMA minimum requirements:	
The City routinely maintains storm drain catch basins; with the goal of cleaning each catch basin at least once annually.	
Existing impediments to running an effective NFIP program:	
None identified.	
Specific actions that are ongoing or considered related to continued compliance with the NFIP:	
None identified.	

L.6.2 SELF-ASSESSMENT OF CAPABILITY

Table L-16
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	High
Administrative and Technical Capability	High
Fiscal Capability	Limited
Education and Outreach Capability	High
Political Capability	Moderate
Overall Capability	Moderate

L.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

L.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new

possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.

- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.
- **2022 General Plan Update:** The General Plan incorporates information on natural hazard risk and polices to reduce risk in its safety element.
- **Sewer System Master Plan:** Considers relevant risk and hazard information from the Hazard Mitigation Plan relevant to the Sewer System.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

L.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Seaside Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Seaside are identified below:

- A critical flooding concern for the city exists in areas along Roberts Lake and Laguna Grande Lake, particularly during heavy rains during winter storms combined with high tides. City Hall and the Police Station are considered vulnerable to flooding due to their low-lying location and proximity to Laguna Grande Lake.
- The City continues to coordinate on potential alternative solutions to problems caused by the 90" outfall in Sand City, which continues to get plugged by shifting sands, preventing drainage of stormwater runoff from Seaside (and Sand City).
- City Hall and the Police Station are susceptible to liquefaction during a major earthquake event.
- The City is concerned with the long-term effects of sea level rise, particularly in terms of exacerbating the effects of saltwater intrusion already being seen in Seaside's aquifer to the north.
- Ingress/egress to the city is limited to only several main transportation corridors (Highway 1 and Route 68) which creates evacuation concerns for the city in response to a major hazard event.
- Climate change is likely to increase the magnitude and impact of storm events, which will exacerbate the impact and lead to more frequent flood events
- The City is concerned about the high threat of wildland fire due to existing fuels in combination with large areas of urban/wildland interface and intermix. Areas of concern include former Fort Ord lands, which include areas where the City is developing. Future climate change and drought conditions is likely to increase wildfire risk.
- The City is concerned about exposure to hazardous materials leaks. This risk is likely to increase due to changing industries within Seaside.

L.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The City of Seaside Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table*

L-18 lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. Table L-17 includes the status of action previous plan completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table L-17
City of Seaside Status of Previous Plan Actions

2016 Action #	Description	Status
1.07	Assure that evacuation is safe and efficient.	Completed/ To Be Continued
1.08	Assure that shelters have adequate capacity.	Completed/ To Be Continued
1.09	Assure that the City is prepared to shelter populations that the Red Cross will not (for example, those who are sick).	Completed/ To Be Continued
1.1	Consider fire safety, evacuation, and emergency vehicle access when reviewing proposals to add secondary units or additional residential units in areas exposed to high fire threat.	Completed/ To Be Continued
1.12	Ensure the safety of pets in an emergency.	Completed/ To Be Continued
2.01	Maintain the Seaside Local Hazard Mitigation Plan (LHMP) and update it on a regular basis. This is to be accomplished by: making the LHMP a part of the City's General Plan; conducting quarterly meetings of the LHMP Working Group; reviewing the plan 2 years after final approval and conducting a major update of the plan within 4 years of approval.	Completed/ To Be Continued
3.18	Identify areas susceptible to tsunami.	Completed
3.19	Identify mitigation measures for tsunami.	Completed
3.2	Identify areas susceptible to wildfire.	Completed
3.21	Identify mitigation measures for wildfire.	Completed
3.22	Ensure that all new construction in areas susceptible to fire is completed using fire resistant design techniques that will limit damage caused by fires. For example, require Class A roofing materials for all homes in areas susceptible to fires.	Completed/ To Be Continued
3.24	Develop a defensible space vegetation program that includes the clearing or thinning of non-fire resistive vegetation, or all non-native species, within 30 feet of access and evacuation roads/routes to critical facilities. Note: <i>The roads that border the Army's Historic Impact Area were transferred with requirements related to the upkeep and maintenance</i>	Completed/ To Be Continued

Table L-17
City of Seaside Status of Previous Plan Actions

2016 Action #	Description	Status
	<i>of fuel breaks. This area has specific planning/design considerations. The Army has a few areas that still require munitions cleanup. Other locations inside the area are proposed for future prescribed burns.</i>	
3.25	Require that development in high fire hazard areas provide adequate access roads (with width and vertical clearance that meet minimum standards of the Fire Code), onsite fire protection system, evacuation signage, and fuel breaks. Note: <i>The roads that border the Army's Historic Impact Area were transferred with requirements related to the upkeep and maintenance of fuel breaks. This area has specific planning/design considerations. The Army has a few areas that still require munitions cleanup. Other locations inside the area are proposed for future prescribed burns.</i>	Completed/ To Be Continued
3.29	Maintain geographic information system and data to accurately reflect existing utilities and critical facilities.	Completed/ To Be Continued
3.32	Improve the utilization of existing information in the forecasting of natural hazards. The City will continue to use NOAA information and to coordinate with Monterey County, along with other available data.	Completed/ To Be Continued
4.01	Provide public information on locations for obtaining sandbags and deliver sandbags to locations throughout the City prior to and during the rainy season.	Completed/ To Be Continued
4.04	Work with local schools (Monterey Peninsula Unified School District and private schools) on disaster preparedness for school children.	Completed/ To Be Continued
4.07	Explore the feasibility of using "Reverse 911" technology to notify the public about impending disasters, Amber Alerts, etc.	Completed
4.09	Use disaster anniversaries, such as October (Loma Prieta earthquake), to remind the public of safety and security mitigation activities.	Completed/ To Be Continued
4.17	Provide information to the public related to family and personal planning for delays due to traffic or road closures.	Completed/ To Be Continued
4.2	Provide information to residents on the availability of hazard maps on the City's website.	Completed/ To Be Continued
6.02	Assure that the Emergency Operations Center is adequately equipped to handle a disaster.	Completed
6.03	Maintain the Emergency Operations Center in fully functional state of readiness.	Completed
6.04	Conduct an Emergency Operations Center full activation exercise at least annually.	Completed/ To Be Continued
6.05	Ensure the protection of communications.	Completed/ To Be Continued
6.07	Improve communications among all City departments.	Completed

Table L-17
City of Seaside Status of Previous Plan Actions

2016 Action #	Description	Status
6.08	Ensure that Fire and Police personnel have adequate radios, breathing apparatus, protective gear, and other equipment needed to respond to a major disaster.	Completed
6.13	Assure temporary and/or mobile office space on high ground is available to the Police Department in the event of a flood or tsunami.	Completed
6.15	Develop procedures for the emergency evacuation of areas identified on tsunami evacuation maps.	Completed
6.2	Promote information sharing among neighboring cities, the county, the state and federal agencies.	Completed/ To Be Continued
7.01	Assure that backup systems exist for critical utilities to the greatest extent possible.	Completed/ To Be Continued
7.02	Talk with local utility companies about their hazard mitigation plans.	Completed/ To Be Continued
7.05	Retrofit or replace critical lifeline facilities and/or backup facilities that are shown to be vulnerable to damage in natural disasters.	Completed/ To Be Continued
7.09	Coordinate with PG&E and others to investigate ways of minimizing the likelihood that power interruptions will adversely impact vulnerable populations, such as the elderly and disabled.	Completed
7.07	Pre-position emergency power generation capacity (or have rental/lease agreements for these generators) in critical buildings to maintain continuity of government and services.	Completed/ To Be Continued
7.11	Assure that utility lines are installed underground for new development.	Completed
7.23	Update Sewer System Master Plan.	Completed

Table L-18
City of Seaside Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazards(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing/ Continuous	Flooding	Provide sandbags and plastic sheeting to residents in anticipation of rainstorms and deliver these materials to disabled and elderly residents on request.	High	Public Works	General Fund
2	Ongoing/ Continuous	All	Ascertain historical incidence and frequency of occurrence of hazards through the development and maintenance of the City of Seaside LHMP.	High	All	General Fund and Grant
3	Ongoing/ Continuous	All	Develop a matrix containing each mitigation goal and actions, relevant hazards, along with project status, funding, and responsible department. This matrix is to be reviewed 2 years after completion of the LHMP and updated within 4 years.	High	All	General Fund and Grant
4	Ongoing/ Continuous	All	Pursue grant opportunities to obtain funding for mitigation activities that protect the City's most vulnerable populations and structures.	High	Finance	Grants, General Fund
5	Ongoing/ Continuous	Earthquake	Continue to actively implement existing State law that requires the City to maintain lists of addresses of unreinforced masonry buildings and inform property owners that they own this type of hazardous structure.	High	Building	General Fund
6	Ongoing/ Continuous	Flooding	Continue to repair and make structural improvements to storm drains, pipelines, and channels to enable them to perform their design capacity in handling water flows.	High	Public Works	General Fund
7	Ongoing/ Continuous	Flooding	Continue maintenance efforts to keep storm drains and channels free of obstructions to allow for the free flow of water.	High	Public Works	General Fund
8	Ongoing/ Continuous	Flooding	Ensure that new development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development.	High	Planning, Public Works, Building	General Fund
9	Ongoing/ Continuous	Flooding	Encourage homeowners in flood-prone areas to participate in home elevation programs.	High	Building	General Fund

Table L-18
City of Seaside Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazards(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
10	Ongoing/ Continuous	Flooding	Ensure that new developments are designed to reduce or eliminate flood damage by requiring lots and rights-of-way are laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practical.	High	Planning, Building	General Fund
11	Continuous	Wildfire, Drought	Develop a coordinated approach between fire jurisdictions and water supply agencies to identify improvements to the water distribution system, focusing on areas of highest wildfire hazard. Ensure a reliable source of water for fire suppression (meeting acceptable standards for minimum volume and duration of flow) for existing and new development. Continue the recently formed Fire Flow Task Force with Cal Am Water and other stakeholders.	High	Fire, Public Works	General Fund and Grant
12	Ongoing/ Continuous	All, Wildfire	Maintain fire roads and public right-of-way roads and keep them passable at all times so that access to areas is assured.	High	Fire, Public Works	General Fund
13	In progress/ 1-4 years	Earthquakes	Adopt a City ordinance that requires the following measures to reduce fire ignitions due to earthquakes: bracing of gas-fired appliances and equipment; flexible couplings on gas appliances; and the bolting of homes to their foundations and strengthening of cripple walls.	High	Building	General Fund
14	Ongoing/ 1-2 years	All	Build and maintain geographic information system and data to improve permitting and building construction.	Moderate	Public Works, Building	General Fund
15	In progress/ 1-2 years	Earthquake, Tsunami, Flooding, Wildfire	Investigate HAZUS to estimate earthquake, tsunami, flood, and wildfire damage in the City.	Moderate	Finance, Public Works	General Fund

Table L-18
City of Seaside Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazards(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
16	In progress/ 1-2 years	All	Explore training opportunities for City personnel in the use of the HAZUS program. Provide this training for key employees and obtain assistance in data entry for the HAZUS program.	Moderate	Finance, Public Works	General Fund
17	Ongoing/ as Needed	All	Aid homeowners whose homes were damaged by disasters by providing a streamlined permitting process for the rebuilding.	Moderate	Building, City Manager	General Fund and Grants
18	Ongoing Continuous	Earthquakes	Encourage the retrofitting of unreinforced masonry structures.	Moderate	Building	General Fund
19	Ongoing/ Continuous	All	Update Geographical Information System (GIS) database to integrate hazard risk areas with existing data. Continue to coordinate with the County to integrate their database.	Low	Public Works	General Fund
20	Ongoing/ Continuous	All	Review census data to locate vulnerable populations.	Low	Finance, Public Works	General Fund
21	1-4 years	All	Pass a City ordinance that will limit building in high-risk areas.	Low	Building	General Fund
22	Ongoing/ Continuous	All	Work with critical health care facilities (long-term care, primary care, or specialty clinics such as home health agencies, or group homes) to ensure that critical facilities are structurally sound and have nonstructural system designed to remain functional following disasters.	Low	Public Works, Building	General Fund
23	Ongoing/ Continuous	Earthquake	Research funding options for the retrofit of seismically deficient City-owned bridges and road structures.	Low	Public Works	General Fund and Grants
24	Ongoing / Continuous	Flooding	Identify buildings at risk from 100-and 500-year floods.	Low	Public Works	General Fund
25	Ongoing / Continuous	Wildfire	Develop a list of programs and resources that provide low-interest loans for residents and businesses to retrofit with fire resistant materials.	Low	Fire	General Fund and Grants
26	Ongoing/ Continuous	All	Increase the level of knowledge and awareness for Seaside City residents on the hazards that routinely threaten the area through appropriate City public education outlets.	Moderate	All	General Fund

Table L-18
City of Seaside Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazards(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
27	Ongoing/ Continuous	All	Obtain adequate funding for public outreach programs.	Moderate	Finance	General Fund
28	Ongoing/ Continuous	All	Encourage citizens to participate in the Community Emergency Response Team (CERT) program through City public education outlets.	Moderate	Fire	General Fund
29	In Progress	All	Develop materials related to disaster mitigation and preparedness in other languages.	Moderate	All	General Fund
30	Ongoing/ Continuous	All	Disseminate information on what to do during and after a hazard event through appropriate City public education outlets, in cooperation with the County and State Offices of Emergency Services and the American Red Cross.	Moderate	All	General Fund
31	Ongoing/ Continuous	All	Continue to identify Seaside's most vulnerable critical facilities and evaluate the potential mitigation techniques for protecting each facility to the maximum extent possible.	High	All	General Fund
32	Ongoing/ Continuous/ 1-4 years	All	Conduct comprehensive programs to identify and mitigate problems with facility contents, architectural components, and equipment that will prevent critical building from being functional after major natural disasters.	High	Public Works	General Fund
33	Ongoing/ Continuous/ 1-4 years	Earthquake	Ensure that all critical facilities are seismically upgraded to the greatest extent possible, in accordance with the most recent building codes.	High	Building	General Fund
34	Ongoing/ Continuous/ 1-4 years	Flooding	Ensure that all critical facilities located in the floodplain are adequately protected from flooding to the greatest extent possible, in accordance with the most recent building codes.	High	Building	General Fund
35	Ongoing / Continuous	All	Provide necessary repairs to maintain critical facilities in top physical condition.	High	Public Works	General Fund
36	In Progress/ 1 year	All	Develop a "Continuity of Government Plan" following FEMA guidelines.	High	Fire	General Fund

Table L-18
City of Seaside Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazards(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
37	In Progress/ 1-4 years	All	Upgrade the City's communications plan.	High	Fire, Police	General Fund
38	In Progress/ 1-4 years	All	Have back-up emergency power available for critical intersection traffic signals.	High	Public Works, Fire, Police)	General Fund
39	Ongoing/ Continuous/ 1-4 years	Earthquake	Participate in the Office of Emergency Services Safety Assessment Program which formalizes arrangements with engineers, building officials and other qualified people to report to the City, assess damage, and determine if buildings can be reoccupied after a disaster.	High	Building, Public Works	General Fund
40	In Progress/ 1 year	All	Prepare a recovery plan that outlines the major issues and tasks that are likely to be the key elements of community recovery, as well as integrate this planning into response planning.	High	All	General Fund
41	In Progress/ 1 year	All	Ensure that emergency services include more than the coordination of Police and Fire responses, but also planning activities with providers of water, food, energy, transportation, financial, information, and public health services.	High	All	General Fund
42	Ongoing/ Continuous/ 1-4 years	All	Provide a new, expanded Public Works Corporation Yard on City-owned former Fort Ord lands.	High	Public Works	General Fund or Measure
43	Ongoing/ Continuous/ 1-4 years	All	Ensure the safety of data by adequately backing up essential records and financial information.	Moderate	City Manager	General Fund
44	In Progress/ 1-2 years	All	Develop and maintain a system of interoperable communications for first responders from cities, the county, the state and federal agencies.	Moderate	Fire, Police	Grant

Table L-18
City of Seaside Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazards(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
45	In Progress/ 1-4 years	All	Improve emergency response communications, including building redundant capacity into public safety alerting, replacing or hardening microwave and simulcast systems, adding digital encryption for programmable radios, and ensuring a plug-and-play capability for amateur radio.	High	Police, Fire	General Fund and Grants
46	Ongoing/ Continuous/ 1-4 years	All	Plan for speeding the repair and functional restoration of lifeline systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies.	High	Public Works, Fire, Police	Seaside Sanitation and Water District Funds
47	Ongoing/ Continuous/ 1-4 years	All	Identify critical areas that would need portable facilities (such as hoses, pumps, generators, or other equipment) to allow pipelines to bypass failure zones such as fault rupture areas, areas of liquefactions, and other ground failure areas.	High	Public Works	Seaside Sanitation District Funds
48	In the CIP/ 1-10 years	All, Earthquake	As funding becomes available, install portable facilities to allow pipelines to bypass critical failure zones such as fault rupture areas, liquefaction areas, and ground failure areas.	High	Public Works	Seaside Sanitation District Funds
49	In the CIP/ 1-4 years	Earthquake	Replace or retrofit water-retention structures that are determined to be structurally deficient.	High	Public Works	Seaside Water District Funds
50	In the CIP	Flooding, Earthquake	Repair 90" Storm Drain Outlet.	High	Public Works	Seaside Sanitation District Funds
51	Ongoing/ Continuous/ 1-2 years	All	Survey Seaside County Sanitation District facilities by remote TV.	High	Public Works	Seaside Sanitation District Funds
52	In the CIP/ 1-4 years	All	Provide new emergency generator set for Seaside City Hall.	High	Public Works	General Fund

Table L-18
City of Seaside Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazards(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
53	Ongoing/ 1-4 years	All	Replace mainline sanitary sewer lines.	High	Public Works	Seaside Sanitation District Funds
54	Ongoing/ Continuous/ 1-4 years	All	Rehabilitate Sanitation District pump stations as needed.	High	Public Works	Seaside Sanitation District Funds
55	Ongoing/ Continuous	Flooding	Ensure that utility systems in new development are constructed in ways that reduce or eliminate flood damage.	Moderate	Building, Public Works	General Fund
56	1-4 years	Severe Weather, Wildfire, Utility Interruption	Establish underground utility district for Highland Avenue.	Moderate	Public Works	General Fund
57	Ongoing/ Continuous/ 1-4 years	Earthquake	Encourage owners of buildings leased by special districts or utility companies to participate in a program similar to San Francisco's Building Occupancy Resumption Program. This program permits owners of buildings to hire qualified structural engineers to create facility-specific post-disaster inspection plans and allows these engineers to become automatically deputized as City inspectors for these buildings in the event of a disaster. This program allows rapid re-occupancy.	Moderate	Public Works, Building	General Fund
58	Ongoing/ Continuous/ 1-4 years	Earthquake	Encourage business owners to participate in a program similar to San Francisco's Building Occupancy Resumption Program. This program permits owners of buildings to hire qualified structural engineers to become automatically deputized as City inspectors for these buildings in the event of a disaster. This program allows rapid re-occupancy of the building.	High	Economic Development, Building, Public Works	General Fund

Table L-18
City of Seaside Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazards(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
59	Ongoing	All	Assist businesses in obtaining grant funding following a disaster.	High	Finance	General Fund
60	New/ 1-4 years	Flooding	Continue to repair and make structural improvements to storm drains, pipelines, and channels to enable them to perform their design capacity in handling water flows.	High	Public Works	General Fund
61	New/ 1 year	All	Continue to identify Seaside's most vulnerable critical facilities and evaluate the potential mitigation techniques for protecting each facility to the maximum extent possible.	High	All	General Fund
62	New	All	Upgrade the City's communications plan.	High	Fire, Police	General Fund
63	New/ 1-2 years	All	Provide new emergency generator set for Seaside City Hall.	High	Public Works	General Fund
64	New/ 1-4 years	All	Rehabilitate Sanitation District pump stations as needed. Replace mainline sanitary sewer lines.	High	Public Works	Seaside Sanitation District Funds

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ANNEX M: CITY OF SOLEDAD



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



M. CITY OF SOLEDAD

M.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

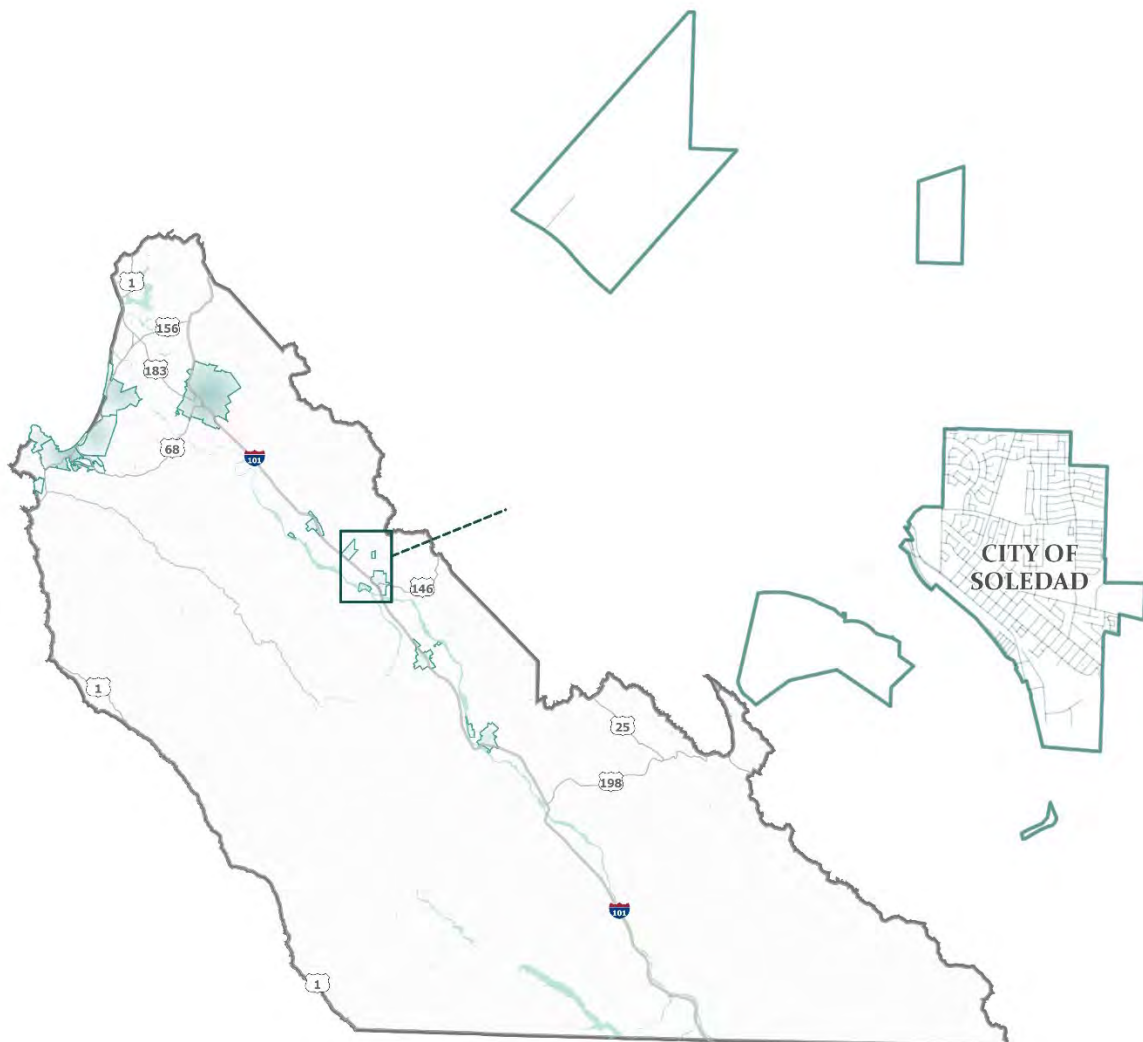
Brent Slama
City Manager
248 Main Street
Soledad, CA 93960
831-223-5043
BSlama@cityofsoledad.com

Alternate Point of Contact

Chief George Nunez
Soledad Fire Department
525 Monterey Street
Soledad, CA 93960
(831) 223-5100
george.nunez@fire.ca.gov

M.2 COMMUNITY PROFILE

M.2.1 LOCATION



M.2.2 GEOGRAPHY AND CLIMATE

The City of Soledad is located approximately 25 miles south of Salinas on Highway 101 and along the Salinas River and in the heart of the famed Salinas Valley, known for its natural beauty and agricultural products. Soledad is located in a prime area for growing wine grapes and within a short distance to many vineyards and famous wineries. Soledad has a warm-summer Mediterranean climate, with very warm, mostly dry summers and cool, wet winters.

M.2.3 HISTORY

The first settlements at Soledad took place when small tribes of Native Americans settled in the Salinas Valley. These people were most likely members of the Costanoan tribe. Life for the Natives around the Soledad area changed dramatically in 1791 when Father Fermin Lasuen founded the thirteenth California Mission, the Mission Nuestra Señora de la Soledad at the site of an Indian village recorded by Pedro Font as Chuttusgelis. In spite of many difficulties, the mission did prosper for a brief period. Eventually, the padres performed more than 2,000 baptisms and 700 marriages. The crops were bountiful and large herds of horses, cattle and sheep grazed the plains. The friars even managed to plant and cultivate the first crops of wine grapes the Salinas Valley ever seen near the Soledad Mission.

One of the major events in Soledad history took place in Salinas. Eugene Sherwood, a cattle rancher understood the importance of the railroad in getting the agricultural products to market. Sherwood offered Southern Pacific Railroad free acreage for a right-of-way and a depot, which opened in 1872. Soledad's original agricultural base prospered on cattle, wheat, and barley until the 1890's when an influx of Swiss and Swedish immigrants established dairy operations in the area. The community's agricultural base changed in the 1920's to the development of row crops.

The City of Soledad was incorporated on March 9, 1921. The City's official name, Soledad meaning "solitude", was derived from the Mission Nuestra Señora de la Soledad. The City's economic base diversified again in the 1940's, with the establishment of the California Department of Corrections' Soledad Training Facility located 3 miles north of the City. The facility was annexed into the City in 1992 and expanded in 1996 with the addition of the Salinas Valley State Prison.

M.2.4 POPULATION

The City of Soledad has a population of 24,925 people, a slight decrease (3.1%) since 2010.

M.2.5 GOVERNING BODY FORMAT

Soledad has a City Council/City Manager form of government. The City Council consists of an elected Mayor holding a two-year term and four Council Members elected at large for four-year overlapping terms. The City Manager, who is appointed by City Council, is responsible for all City departments. The City Council legislates policies, enacts ordinances, approves the budget, and appoints advisory boards and commissions.

M.2.6 ECONOMY AND TAX BASE

The City of Soledad is highly motivated to provide economic development for the community by delivering prompt and efficient access to resources to businesses. The city maintains some of the lowest development fees in the region and provides a competitive business license fee schedule.

Soledad's strategic location on US Highway 101 provides significant economic opportunities, offering a scenic north-south corridor for regional motor and rail travel and tourism. The City continues to invest in the Soledad Business Center at a prime downtown storefront location where existing and prospective business owners and entrepreneurs receive free or low-cost business counseling, financial planning services, and classroom learning opportunities. The Soledad Industrial Park offers light and heavy industrial manufacturers with a convenient location to build adjacent to the busiest highway and rail shipping lanes on the west coast.

M.3 PLANNING PROCESS

The City of Soledad followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the City formulated their own internal planning team to support the broader planning process.

The City of Soledad held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on August 18, 2021. Key stakeholders present at the meeting included:

- Brent Slama, City Manager
- Damon Wasson, Police Chief
- Oscar Espinoza, City Engineer
- George Nunez, Fire Chief
- Lynnelle Sanchez, Community Engagement Manager
- Rebecca J. Hall, Recreation Manager
- Bryan T. Swanson, Community and Economic Development Director

M.4 LAND USE AND DEVELOPMENT

The Soledad General Plan was adopted in 2005. The City's population experienced steady growth throughout the 1990s and the pace accelerated between 1997 and 2001. In 2003, Soledad ranked eight among the fastest growing cities in the State and residential development occurred at an accelerated pace between 1997 and 2003. The growth in population has stabilized since 2010 with no population growth between 2010 and 2019.

Excluding vacant land, 58% of Soledad is currently used for residential uses. Commercial and industrial uses consist of 6% and 11% of the available land. The City is surrounded by productive agricultural land, primarily categorized as "prime farmland" by the State Department of Conservation. A significant portion of neighboring lands is protected by Williamson Act restrictions. The existing City limits contain approximately 3,000 acres. The 2005 General Plan anticipates the development of five expansion areas on 3,254 acres that would more than double the City's area.

Since the early 2000's, the City of Soledad has played a major role in fostering and increasing much-needed units of affordable housing to support the diverse needs of Monterey County's growing workforce. Since 2015, the City has been working closely with developers to add single family and multi-family housing to areas approved for development before 2008. This housing development boom is increasing economic development opportunities for small businesses, franchise businesses,

service providers, medical facilities, entertainment venues, and large retailers who seek to expand to an untapped market.

Safe Growth

The purpose of the Safe Growth Survey was to evaluate the extent to which each jurisdiction is positioned to grow safely relative to its natural hazards. The survey covered 9 distinct topic areas and was also completed as part of the previous plan update process. This allowed survey results to be compared to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices.

This survey was a subjective exercise used to provide some quantitative measures of how adequately existing planning mechanisms were being used to address the notion of safe growth. Each topic area included a number of statements, which were answered on a scale from 1 to 5 based on the degree to which the respondent agreed or disagreed with the statement as it relates to the City's current plans, policies, and programs for guiding future community growth and development. Scores for each topic area statement were averaged to provide a topic area result and the topic area totals were averaged to provide an overall survey score. More information on the survey is provided in *Capability Assessment* in **Volume 1**.

The City of Soledad Safe Growth Survey was completed by Bryan Swanson, Community and Economic Development Director for the City of Soledad. The results are summarized in *Table M-1*.

Table M-1
City of Soledad Safe Growth Survey Results

Topic Area	2021	2016
Land Use	3.75	3.75
Transportation	3.67	3.33
Environmental Management	3.00	3.67
Public Safety	3.00	2.67
Zoning Ordinance	3.75	4.00
Subdivision Regulations	4.00	3.00
Capital Improvement Program & Infrastructure Policies	3.00	3.00
Building Code	5.00	4.00
Economic Development	4.00	3.00
Average Survey Ratings	3.69	3.38

M.5 JURISDICTION SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the City of Soledad's hazards and assess the City's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the City of Soledad is included in this Annex.

The City of Soledad's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The City's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey

to compare the impact of various hazards that could affect the City. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**.

Table M-2 displays the results of the hazard risk ranking exercise that was performed by the City of Soledad's Planning Team.

Table M-2
Threat Hazard Identification Risk Assessment (THIRA): City of Soledad

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	3.7	3.3	3.3	3.5	13.8	High
Coastal Erosion	-	-	-	-	-	-
Coastal Flooding	-	-	-	-	-	-
Cyber-Attack	3.0	2.8	3.3	3.5	12.7	High
Dam Failure	1.8	1.8	2.0	2.0	7.7	Possible
Drought & Water Shortage	3.5	3.5	3.3	3.5	13.8	High
Earthquake	3.7	3.5	3.8	4.0	15.0	Very High
Epidemic	3.5	2.8	3.5	3.5	13.3	High
Extreme Cold & Freeze	2.2	1.8	2.0	2.3	8.3	Moderate
Extreme Heat	2.5	2.5	2.5	2.7	10.2	Substantial
Flash Flood	2.2	2.0	2.3	2.5	9.0	Moderate
Hazardous Materials Incident	2.8	2.8	3.2	3.2	12.0	Substantial
Invasive Species	2.5	2.2	2.7	2.7	10.0	Moderate
Levee Failure	2.5	2.5	2.8	2.8	10.7	Substantial
Localized Stormwater Flooding	2.3	2.7	2.7	2.7	10.3	Substantial
Mass Migration	1.8	1.7	1.8	2.0	7.3	Possible
Pandemic	3.2	3.0	3.3	3.5	13.0	High
Riverine Flooding	2.2	2.2	2.2	2.3	8.8	Moderate
Sea Level Rise	-	-	-	-	-	-
Severe Winter Storms	2.0	2.0	2.3	2.3	8.7	Moderate
Slope Failure	2.3	2.3	2.5	2.5	9.7	Moderate
Targeted Violence	2.0	2.0	2.5	2.5	9.0	Moderate
Terrorism	2.0	2.0	2.0	2.2	8.2	Moderate
Tsunami	-	-	-	-	-	-
Utility Interruption/ PSPS	3.2	3.2	3.3	3.3	13.0	High
Water Contamination	2.2	2.2	2.8	2.8	10.0	Moderate
Wildfire	3.2	3.0	3.2	3.3	12.7	High
Windstorms	2.5	2.7	2.5	2.7	10.3	Substantial

M.5.1 AGRICULTURAL EMERGENCIES

The agricultural industry is a major economic driver in the City. Agricultural disasters pose a serious threat to the local economy and populations directly employed by the agriculture industry.

M.5.2 COASTAL EROSION

The City is not located on the coast, and therefore coastal erosion is not a major threat. Coastal erosion does threaten agricultural land in the Salinas Valley, which if impacted could have indirect economic effects on the local economy. The City could also be impacted by other types of erosion not profiled in this Plan.

M.5.3 DAM AND LEVEE FAILURE

Dam Failure

There is no population or property in the City located in the dam inundation zones of the Los Padres and Forest Lake dams. *Table M-3* summarizes population and property in the City exposed to spillway and dam failure of the Nacimiento and San Antonio dams.

Dam Failure Scenario	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Nacimiento Spillway Failure	33	0	\$0	6	\$3,559,237
Nacimiento Dam Failure	33	1	\$372,410	6	\$3,559,237
San Antonio Spillway Failure	33	0	\$0	4	\$3,557,985
San Antonio Dam Failure	33	1	\$372,410	6	\$3,559,237

Levee Failure

Based on Leveed Area from the US Army Corps of Engineers, National Levee Database, there is no population or property in the City exposed to levee failure risk. A levee protects the City's Sewer Plant, that if it were to fail could impact City services. Many levees in the County protect important agricultural lands and a significant levee failure could have an indirect economic effect on the City.

M.5.4 DROUGHT AND WATER SHORTAGE

The entire population of the City is vulnerable to drought events. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Drought also is often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Water shortages can affect access to safe, affordable water, with substantial impacts on low-income families and communities burdened with environmental pollution.

A prolonged drought could also cause economic impacts. Increased demand for water and electricity may result in shortages and higher costs of these resources. While economic impacts will be most

significant on industries that use water or depend on water for their business, cascading economic effects can hurt many sectors of the economy. Agriculture, which will likely be impacted by drought conditions, is a major economic driver in the County, and the City could be impacted economically.

M.5.5 EARTHQUAKE

The entire population of the City is potentially exposed to direct and indirect impacts from earthquakes. Whether directly impacted or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself. Similarly, all property and critical infrastructure in the City is potentially exposed to earthquake risk.

According to Monterey County Assessor records, there are 3,472 residential and non-residential buildings in the City, with a total value of \$1,196,653,437. Since all structures in the City are susceptible to earthquake impacts to varying degrees, this represents the property exposure to seismic events.

Additionally, liquefaction risk was assessed. *Table M-4* summarizes population and property in the City exposed to liquefaction risk.

Table M-4
Population and Property Exposed to Liquefaction Risk in Soledad

Liquefaction Risk	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
High Liquefaction Susceptibility	3,874	627	\$240,528,528	80	\$9,211,229
Moderate Liquefaction Susceptibility	4,359	344	\$108,021,717	429	\$111,083,587

M.5.6 FLOODING

FEMA flood zones were used to assess flooding risk. *Table M-5* summarizes population and property in the City in the 100-year and 500-year floodplain.

Table M-5
Population and Property Exposed to Flooding Risk in Soledad

FEMA Flood Zone	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
100-Year Flood Zone	33	1	\$372,410	8	\$7,973,126
500-Year Flood Zone	0	0	\$0	0	\$0

Areas of flood concern for the City include Stonewall Canyon and Bryant Canyon, areas that experienced serious flooding in the 90s and include more residential development today.

M.5.7 HAZARDOUS MATERIALS INCIDENT

To assess hazardous materials incident risk, buffer distances were used. The chosen buffer distance was based on guidelines in the US Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the

“protective action distance” is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used, but actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

To analyze the risk to a transportation-related hazardous materials release, a one-mile buffer was applied to highways in the US Dept of Transportation, National Transportation Atlas Database. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. Risk from a fixed facility hazardous materials release, was analyzed using a one-mile buffer was applied facilities identified in the Monterey County 2019 Hazardous Materials Plan. The result was a one-mile buffer zone around each facility.

Table M-6 summarizes population and property that could be exposed to both mobile and fixed hazardous materials incidents.

Table M-6

Population and Property Exposed to Hazardous Materials Incident Risk in Soledad

Hazardous Materials Incident Type	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Mobile Source	21,361	2,124	\$749,768,786	652	\$147,118,221
Fixed Source	139	18	\$527,629.00	33	\$4,381,502

M.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

M.5.9 PUBLIC HEALTH HAZARDS

All citizens in the City could be susceptible to the human health hazards. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population. While all of the population is at risk to the human health hazards, the young and the elderly, those with compromised immune systems, and those with special needs are most vulnerable. The introduction of a disease such as influenza or the Covid-19 virus have impacted the whole population of the City, specifically vulnerable populations.

M.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to happen anywhere in the City. Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Properties in poor condition or in high-risk locations may be susceptible to the most damage. All critical facilities in the City likely exposed to severe weather hazards. The most common problems associated with severe weather are loss of utilities and compromised access to roadways. Prolonged periods of extreme heat could result in power outages caused by increased demand for power for cooling.

The FEMA National Risk Index calculates annualized frequency, exposure and annual expected loss of building value and population to some severe weather hazards identified in this Plan. Based on zip code and census tract Countywide data was used to identify annualized frequency, exposure, and annual expected loss in the City from severe weather hazards. Though the entire City is considered vulnerable to these hazards, the FEMA data was used in this risk assessment to provide scale for the potential risk and impacts. FEMA National Risk Index data from frequency and exposure to severe weather hazards is summarized in *Table M-7*.

Table M-7
Annualized Frequency and Exposure to Severe Weather Events in Soledad

Hail		Strong Wind	
Frequency (<i>Distinct Events</i>)	0.36	Frequency (<i>Distinct Events</i>)	0.11
Exposed Population	21,563	Exposed Population	21,563
Exposed Building Values	\$976,282,000	Exposed Building Values	\$976,282,000
Expected Annual Loss of Building Value	\$0	Expected Annual Loss of Building Value	\$328
Heat Wave		Tornado	
Frequency (<i>Event-Days</i>)	1.05	Frequency (<i>Distinct Events</i>)	1.28
Exposed Population	21,563	Exposed Population	5,715
Exposed Building Values	\$976,282,000	Exposed Building Values	\$138,975,676
Expected Annual Loss of Building Value	\$2	Expected Annual Loss of Building Value	\$3,553,082
Lightning		Winter Weather	
Frequency (<i>Distinct Events</i>)	0.58	Frequency (<i>Event-Days</i>)	0.00
Exposed Population	21,563	Exposed Population	0
Exposed Building Values	\$976,282,000	Exposed Building Values	\$0
Expected Annual Loss of Building Value	\$177	Expected Annual Loss of Building Value	\$0

Source: FEMA National Risk Index

M.5.11 SLOPE FAILURE

Based on the FEMA National Risk Index, 662 people and \$50,247,148 in building value in the City is exposed to landslide risk. Additionally, the City is not susceptible earthquake induced to landslides.

M.5.12 TSUNAMI

The City is not located in a mapped tsunami inundation zone.

M.5.13 UTILITY INTERRUPTION

All residents, visitors, and property in the City is exposed and vulnerable to utility interruptions. All critical facilities and infrastructure in the City that is operated by electricity is exposed and vulnerable to utility interruption.

M.5.14 WILDFIRE

For purposes of this analysis CAL FIRE Fire Threat data was used. Fire Threat combines expected fire frequency with potential fire behavior to create 4 threat classes, extreme, very high, high, and moderate.

Table M-8 summarizes population and property in the City in very high, high, and moderate fire threat areas.

CAL FIRE Wildfire Threat	Population	Residential Property		Non-Residential Property	
		#	Value	#	Value
Very High Fire Threat	0	0	\$0	3	\$5,672
High Fire Threat	141	18	\$527,629	39	\$6,522,413
Moderate Fire Threat	12,485	167	\$30,168,583	132	\$44,060,253

M.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will affect the people, property, economy, and ecosystems in the City and will exacerbate the risk posed by many of the hazards previously profiled in this Plan. Climate change will have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures will have direct impacts on public health and infrastructure. Drought, flooding, and wildfire will likely affect people's livelihoods and the local economy. Changing weather patterns and more extreme conditions are likely to impact tourism and the local economy, along with changes to agriculture and crops, which are a critical backbone of the City's economy.

M.6 CAPABILITY ASSESSMENT

The City of Soledad performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table M-9*
- An assessment of administrative and technical capabilities is presented in *Table M-10*
- An assessment of fiscal capabilities is presented in *Table M-11*
- An assessment of education and outreach capabilities is presented in *Table M-12*
- Classifications under various community mitigation programs are presented in *Table L-13*
- A summary of participation in and compliance with the National Flood Insurance Program (NFIP) is provided in Section M.6.1 in *Table M-14*
- An overall self-assessment of capability is presented in Section M.6.2 in *Table M-15*

Table M-9
Planning and Regulatory Capability

Document	Department	Comments
Planning Documents		
General Plan	☒ • Community Development	Will be updating the current General Plan in 2022.
Capital Improvement Plan	☒ • Public Works	
Floodplain Management Plan	☐	
Open Space Management Plan	☒ • Planning Department	Will need to updated with the process of updating the current General Plan in 2022.
Stormwater Management Plan	☒ • Public Works	
Coastal Management Plan	☐	N/A
Local Coastal Program	☐	N/A
Climate Action/ Adaptation Plan	☒ • Community Development	Will need to updated with the process of updating the current General Plan in 2022.
Emergency Operations Plan	☒ • Police Department	
Continuity of Operations Plan	☐	
Community Wildfire Protection Plan	☐	
Evacuation Plan	☐	
Disaster Recovery Plan	☐	
Economic Development Plan	☐	
Historic Preservation Plan	☒ • Community Development	City registry of historic resources.
Transportation Plan	☒ • TAMC	
Codes, Ordinances & Requirements		
Floodplain Ordinance	☒ • Community Development	
Zoning Ordinance	☒ • Community Development	Portions of the Zoning Ordinance will be updated via a SB 2 Grant.
Subdivision Ordinance	☒ • Community Development	
Site Plan Review Requirements	☒ • Community Development	
Unified Development Ordinance	☐	
Post-Disaster Redevelopment/ Reconstruction Ordinance	☐	
Building Code	☒ • Building Department	Adoption of New CA Codes every 3 years.
Fire Prevention Code	☒ • Building Department	CA Fire Code adopted every 3 years.

Table M-10
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒ • Community Development • Public Works	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒ • Community Development • Public Works	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒ • Community Development • Public Works	
Building Inspector	☒ • Community Development • Public Works	
Emergency Manager	☐	
Floodplain Manager	☒ • Community Development	
Land Surveyors	☐	
Resource development staff or grant writers	☒ • Community Development	
Public Information Officer	☒ • Community Engagement	
Scientist(s) familiar with the hazards of the community	☐	
Staff with education or expertise to assess the community's vulnerability to hazards	☐	
Personnel skilled in Geographic Information Systems (GIS)	☒ • Public Works	
Maintenance programs to reduce risk	☐	
Warning systems/services	☐	
Mutual Aid Agreements	☒	Have mutual aid agreements with neighboring cities.

Table M-11
Fiscal Capability

Fiscal Resources	Department	Comments
General Funds	☒ • Finance	
Capital Improvements Project Funding	☒ • Finance	
Special Purpose Taxes	☒ • Finance	
Stormwater Utility Fees	☐	

Table M-11
Fiscal Capability

Fiscal Resources	Department	Comments
Gas / Electric Utility Fees	☐	
Water / Sewer Fees	☐	
Development Impact Fees	☒	
General Obligation Bonds	☒ • Finance	
Special Tax and Revenue Bonds	☒ • Finance	
Community Development Block Grants (CDBG)	☐	

Table M-12
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☐	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒ • Community Engagement	
Natural disaster or safety related school programs	☐	
Public-private partnership initiatives addressing disaster-related issues	☐	

Table M-13
Community Classifications

	Participating?	Classification	Effective Date
Community Rating System (CRS)	No	-	-
ISO Public Protection Classification			
<i>StormReady</i> Certification	No	-	-
<i>TsunamiReady</i> Certification	N/A	-	-
<i>Firewise Communities</i> Certification	No	-	-

M.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

Table LM14

National Flood Insurance Program (NFIP) Compliance

Designated Floodplain Administrator:	Bryan Swanson, Community/Economic Development Department Director
NFIP Community Number:	060204
Flood Insurance Policies in Force:	1
Insurance Coverage in Force:	\$350,000
Written Premium in Force:	\$467
Total Loss Claims:	0
Total Payments for Losses:	0
Adopted Regulations that meet NFIP Requirements:	
• Ordinance 596 Adopted 2002 – Floodplain Management	
• Resolution Adopted 2016 - Monterey County Multi-Hazard Mitigation Plan 2015	
Date of last NFIP Community Assistance Visit (CAV):	Unknown.
Higher standards that exceed minimum NFIP requirement:	The City of Soledad follows minimum NFIP requirements, no additional requirements have been implemented.
Additional floodplain management provisions:	Some floodplain management provisions that are integrated into other plans or processes that the community uses to guide development within the City of Soledad would be our 2005 General Plan, within the Hazards Safety section. A new update on our 2005 General Plan will become available in 2025 where this topic will be updated to accommodate City's future growth. The City of Soledad will also be updating its zoning ordinance code which the floodplain management could be a factor to consider as staff reviews new changes.
Floodplain management activities performed that go beyond FEMA minimum requirements:	The City of Soledad performs the minimum FEMA requirements for floodplain management.
Existing impediments to running an effective NFIP program:	An existing impediment to running an effective NFIP program in the community would be having adequate staffing resources and funding. With the proper staffing and funding, outreach within the community will help educate our residents but also help the City of Soledad understand other issues members of the community may have regarding other hazard activities.
Specific actions that are ongoing or considered related to continued compliance with the NFIP:	A specific action that the City of Soledad can take related to continued compliance with the NFIP would be to gather data in a digital format for easier recording and for easier data access. Other possible new actions considered include:
• Maintain digital FEMA elevation certificates for all construction in the floodplain.	
• Develop a checklist for review of building/development permit plans and for inspection of development in floodplains.	
• Establish a goal to have each plan reviewer and building inspector attend a related training periodically.	

Table LM14
National Flood Insurance Program (NFIP) Compliance

- Maintain a map of areas that flood frequently (e.g., areas where repetitive loss properties are located) and prioritize those areas for inspection immediately after the next flood. If outside FEMA special flood hazard areas, consider requiring existing NFIP regulatory standards (compliance with existing ordinance) through overlay zoning, etc.
- Obtain FEMA's Substantial Damage Estimator and attend training to be prepared to use it when damage occurs; develop mutual aid agreements with other jurisdictions to augment local inspection personnel after major disasters.
- Develop handouts for permit applications on specific issues such as installation of manufactured homes in flood hazard areas according to HUD's installation standards, or guidance on improving/repairing existing buildings to better withstand potential hazards.

M.6.2 SELF-ASSESSMENT OF CAPABILITY

Table M-15
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Moderate
Fiscal Capability	Limited
Education and Outreach Capability	Moderate
Political Capability	High
Overall Capability	Moderate

M.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

More financial and service support from Federal, State and County jurisdictions. With the creation of the new General Plan, critical elements such as: Climate Action Plan, Hazard Mitigation Plan, Land Use Element and Circulation can serve as tools to gain more funding to offset any hazards that may come to Soledad. Being a small community in south Monterey County, Soledad could be on an "island" if an earthquake or other disaster would occur. With the establishment of these new elements will hopefully provide mitigation measures for Soledad as to when/if a disaster strike.

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

M.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the City made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The City will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.
- **Building Code:** The City's adoption of the 2016 California Building Code incorporated local modifications addressing seismic and fire hazards.
- **Regulatory Codes:** A number of the City's existing codes and ordinances include provisions to reduce hazard risk including the zoning code, storm water management code and flood damage prevention ordinance.

Opportunities for Future Integration

The General Plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. The General Plan is considered to be an integral part of this plan. An update to the General Plan may trigger an update to the hazard mitigation plan. The City, through adoption of a General Plan and zoning ordinance, has planned for the impact of natural hazards. The process of updating this hazard mitigation plan provided the opportunity to review and expand on policies in these planning mechanisms. The City will create a linkage between the hazard mitigation plan and the General Plan by identifying a mitigation action as such and giving that action a high priority. Other planning processes and programs that may be coordinated with the recommendations of the hazard mitigation plan include the following:

- General Plan, including the Safety Element
- Emergency Operations Plans
- Climate Action and Adaptation Plans
- Debris management plans
- Recovery plans

- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be integrated via the update process.

M.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the City of Soledad Planning Committee identified key vulnerabilities and hazards of concern applicable to their jurisdiction. The Hazard Problem Statements were based on the risk assessment, the vulnerability analysis, and local knowledge.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the City of Soledad are identified below:

- The City's wastewater treatment plant along the Salinas River is the critical facility deemed most at risk to flooding damage and service interruption. As a result of past floods, the river channel has moved closer to the plant and right up against the protective levee, which due to increased threat, should be raised and strengthened despite being designed for the 100-year flood event. Further, the plant's electrical and mechanical equipment is not elevated so the levee is the only protective measure currently in place.
- Areas surrounding the Highway 101 overpasses, especially near shopping centers, are deemed vulnerable to flooding. The source of past flooding events wasn't limited to the Salinas River, but also runoff from mountains as conveyed through the Bryant Canyon Channel managed by MCWRA.
- The City frequently must respond to fires in the Salinas River bottom, mainly due to uncontrolled vegetation growth. The greatest threat to structures caused by wildland fire is to eastern portions of the city, although risk is managed through weed abatement and fuels reduction program, combined with local development regulations for any new construction along wildland/urban interface (sprinkler and roof type requirements, etc.). The most significant effect caused by the wildland fire hazard is deemed to be the public health threat created by smoke and reduction in air quality across the entire city during large events.

- The City still has a number of old URM buildings located in its downtown area. While each has been posted with a warning placard the city's inventory should be used to identify and prioritize structures for seismic retrofitting.
- Highway 101 is the only lifeline/ ingress egress route in the event of a major evacuation. No backup route exists or routes in the East/West direction. A closure of the freeway would severely limit movement. A mass casualty event, hazmat event, or failure of infrastructure on Highway 101 is a major concern.
- Cumulative and constant hazards, particularly as hazards are exacerbated by climate change, can quickly overwhelm the City's limited response capability and resources.
- Civil unrest is a genuine concern for the City of Soledad. Because of the ingress/egress issues leading to the City, activists and those with violent agendas could potentially isolate the City by blocking or limiting the entrance and exits. For a City with a small law enforcement presence blocking assistance coming to the City from outside aid could seriously damage City infrastructure and be potentially life-threatening to citizens.

M.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success. The City of Soledad Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the City's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table M-17* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the City during the planning process. *Table M-16* includes the status of action previous plan completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the City added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table M-16
City of Soledad Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
3	Develop audience-specific hazard mitigation outreach efforts. Audiences include the elderly, children, tourists, non-English speaking residents, and home and business owners.	Completed/ Ongoing	Completed and done on a project-by-project basis

Table M-17
City of Soledad Hazard Mitigation Action Plan Matrix

Action #	Status/Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	If Funding Allows	All, Wildfire, Earthquake	Create incentives (e.g., rebates) to promote homeowner/business owner disaster-resistant development (e.g., Class A roofing material).	Moderate	Fire	USFA, PDM, and HGMP Grants
2	If Funding Allows	All	Identify hazard-prone critical facilities and infrastructure and carry out acquisition, relocation, and structural and nonstructural retrofitting measures as necessary.	Priority / High	Public Works	PDM and HGMP Grants
3	If Funding Allows	Earthquake	Develop an unreinforced masonry grant program that helps correct earthquake-risk nonmasonry building problems, including chimney bracing and anchoring water heaters.	Low	Community Development	PDM and HGMP Grants
4	If Funding Allows	Flooding	Identify and carry-out minor flood and stormwater management projects that would reduce damage to infrastructure and damage due to local flooding/inadequate drainage. These include the modification of existing culverts and bridges, upgrading capacity of storm drains, stabilization of streambanks, and creation of debris or flood/stormwater retention basins in small watersheds.	Priority / High	Public Works	PDM and HGMP Grants
5	If Funding Allows	Wildfire	Create defensible space guidelines for both new and existing buildings that are in areas of very high and extreme fire hazard areas.	Moderate	Fire	USFA, PDM, and HGMP Grants
6	New	All	Work with County, State, and Federal Partners to determine ingress/egress improvements and to create back-up route options.	Priority / High	Fire, Police, Public Works	Grants
7	New	All	Create and refine the City's Evacuation Plan.	Priority / High	Fire, Police	General Funds
8	New	All	Explore possibility of creating a CERT Team.	Priority / High	Recreation, Admin	Grants, General Funds
9	New	All	Update the City's General Plan and include reference to the Multi-Jurisdictional Hazard Mitigation Plan.	Priority / High	Community Development	Grants, General Funds

Table M-17

City of Soledad Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
10	New	All	Work with local schools on fire and disaster preparedness for school children and use social media to spread awareness of public engagement programs.	Priority / High	Fire, Admin	Grants, General Funds
11	New	Drought	Provide public information on water conservation.	Moderate	Admin	Grants, General Funds

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ANNEX N: CARMEL AREA WASTEWATER DISTRICT



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



N. CARMEL AREA WASTEWATER DISTRICT (CAWD)

N.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

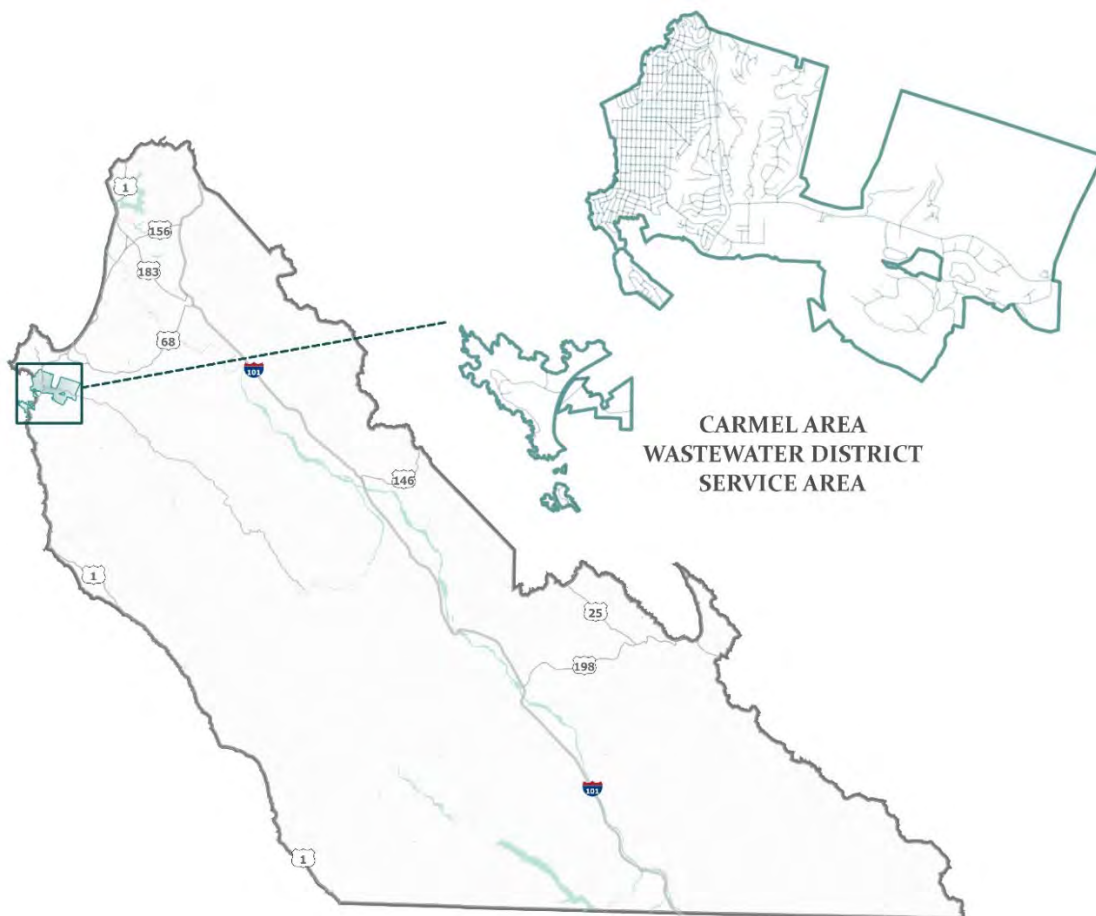
Barbara Buikema
General Manager
3945 Rio Road
Carmel, CA 93922
(831) 624-1248
Buikema@cawd.org

Alternate Point of Contact

Patrick Treanor
Plant Engineer
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Carmel, CA 93922
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treanor@cawd.org

N.2 DISTRICT PROFILE

N.2.1 LOCATION



N.2.2 SERVICE AREA

The Carmel Area Wastewater District (CAWD) provides sewer collections and wastewater treatment in the greater Carmel area. Sewer collections system infrastructure is located in the City of Carmel-by-the-Sea, unincorporated areas of Carmel, and extends east to serve lower portions of Carmel Valley, and south as far as Carmel Highlands. The existing CAWD treatment plant is on the south bank of the Carmel River approximately one-third of a mile west of the State Route 1 Bridge. The administration office is located at 3945 Rio Road, Carmel.

The District maintains eighty-one miles of sewers within the existing service area. The total service area consists of approximately 9.75 square miles with a permanent population of approximately 11,000 and a vibrant tourist industry. CAWD also provides treatment service by contract agreement with [Pebble Beach Community Services District](#) for an additional 4,500 people and businesses in Del Monte Forest. Furthermore, CAWD provides recycled water to seven world famous golf courses in Del Monte Forest including Pebble Beach, Poppy Hills, and Spanish Bay. About 90% of the wastewater received at the treatment plant is treated to California recycled water standards and sent to the golf courses.

In 2021 CAWD anticipates completion of an annexation which will increase the size of the District to 11.3 square miles and will include additional area in the unincorporated communities of Carmel Valley and Carmel Highlands. After the annexation an additional 1,800 residents would be included within the District service area.

CAWD is also a partner in a project that supplies recycled water to the world-famous golf courses in Del Monte Forest including Pebble Beach Golf Links. The recycled water infrastructure project (known as the CAWD/PBCSD Reclamation Project) is co-owned by CAWD and Pebble Beach Community Services District (PBCSD). The CAWD/PBCSD Reclamation Project is a cooperative effort of three public agencies: PBCSD, the Carmel Area Wastewater District (CAWD), and Monterey Peninsula Water Management District (MPWMD); and two private entities who manage the golf courses in Pebble Beach/Del Monte Forest: The Pebble Beach Company, and the Independent Reclaimed Water Users Group (IRWUG).

N.2.3 HISTORY

The Carmel Area Wastewater District was formed as the Carmel Sanitary District in 1908. At that time, the District provided septage facilities for the village of Carmel-by-the-Sea. The Carmel Area Wastewater District is one of the oldest sanitary districts in the state.

N.2.4 GOVERNING BODY FORMAT

The Carmel Area Wastewater District (CAWD) is an independent special district organized under the Sanitary District Act of 1923. CAWD is owned, operated, and managed by the community via an elected Board of Directors.

Like the majority of public wastewater treatment facilities in California, CAWD is a Publicly Owned Treatment Works or POTW. The Elected Board sets policy, determines budget, plans for expansion or upgrade, authorizes large purchases, and in general controls the overall direction of the operation. Any resident of the District has the right to run for and be elected to serve office on the Board.

N.3 PLANNING PROCESS

The Carmel Area Wastewater District followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the District formulated their own internal planning team to support the broader planning process. The Carmel Area Wastewater District held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies on August 2, 2021. Key stakeholders at the meeting included:

- Patrick Treanor, Plant Engineer
- Chris Foley, Maintenance Superintendent
- Ed Waggoner, Operations Superintendent
- Daryl Lauer, Collections Superintendent
- Rachél Lather, Principal Engineer

N.4 FACILITIES

The CAWD facilities include a network of hazard vulnerable critical infrastructure and assets included in three major infrastructure divisions within the District:

- Collection System
- Wastewater Treatment Plant
- Recycled Water Treatment Facilities

The purpose of the CAWD infrastructure is to protect public health and the environment by the control of sewage generated by the constituents. As such the CAWD facilities are regulated primarily by the Regional Water Quality Control Board (RWQCB) and Environmental Protection Agency (EPA) pursuant to the Clean Water Act.

N.4.1 COLLECTION SYSTEM

The collection system has been built up incrementally over the last 100+ years to support development of the community. The collection system provides the conveyance of wastewater from a business or residence to the wastewater treatment plant using underground pipes and lift stations. The CAWD collection system consists of approximately 81 miles of gravity sewers ranging in size from 6 inches to 27 inches in diameter, nearly 4 miles of force mains, 7 pump stations, and over 1,500 manholes.

The collection system is distributed over a range of geographic areas within the CAWD service area and thus can be subject to a wide range of local hazards depending on the specific location. For instance, collections pipelines can be located in inland areas on steep slopes which are subject to local erosion that undermines pipelines. Whereas some pump stations and pipelines within the collection system are located on or near the coastline and those may be subject to effects of coastal erosion, tsunami, and/or sea level rise.

The CAWD collection system infrastructure is important to protect the public health and the environment from the effects of sewage contamination. Hazard mitigation for the collection system should focus on: Coastal Erosion, Coastal Flooding, Cyber-Attack, Drought & Water Shortage,

Earthquake, Epidemic, Extreme Cold & Freeze, Extreme Heat, Flash Flood, Levee Failure, Localized Stormwater Flooding, Pandemic, Riverine Flooding, Sea Level Rise, Severe Winter Storms, Slope Failure, Tsunami, Utility Interruption/ PSPS, Water Contamination, Wildfire, Windstorms.

N.4.2 WASTEWATER TREATMENT PLANT (WWTP)

The CAWD Wastewater Treatment Plant (WWTP) includes a wide range of facilities and specialized equipment that cleans the wastewater for either disposal to the Pacific Ocean, or preparation prior to additional advanced recycled water treatment. The treatment plant utilizes clarifiers, aeration basins, chemical disinfection systems, pumping stations, digesters, solids dewatering equipment, and other processes. The WWTP operates under a National Pollution Discharge Elimination System (NPDES) permit which stipulates water quality requirements for the treated water. The permitted capacity of the WWTP is 3 million gallons per day (MGD) of dry weather flow.

Current average dry weather flow (ADWF) is approximately 1.1 MGD. Approximately two-thirds of the flow into the WWTP is from CAWD customers and the remaining one-third is from Pebble Beach Community Service District customers. During large storm events the inflows can increase up to eight times the dry-weather rates. This requires the plant equipment and processes be designed to handle large peak hydraulic loads during the winter months.

The WWTP is located south of the Carmel River in a historic coastal floodplain and can be subject to short duration flood events during winter. The original design incorporated elevated structures to allow the WWTP to function uninterrupted during onsite flooding. The flooding onsite has been historically very rare, and structures are designed to operate at flood levels beyond the 100-year FEMA flood stage. However, onsite flooding may become more frequent as the effects of climate change unfold, and this is a major concern for the future of the WWTP in its current location.

The CAWD WWTP infrastructure is important to transform sewage into clean water to protect the public health and the environment from the effects of sewage contamination. Hazard mitigation for the WWTP should focus on: Coastal Flooding, Cyber-Attack, Dam Failure, Drought & Water Shortage, Earthquake, Epidemic, Extreme Cold & Freeze, Extreme Heat, Flash Flood, Pandemic, Riverine Flooding, Sea Level Rise, Severe Winter Storms, Terrorist Attack, Tsunami, Utility Interruption/ PSPS, Water Contamination, Wildfire, Windstorms.

N.4.3 RECLAMATION PLANT (RECYCLED WATER FACILITIES)

The Reclamation Plant provides the advanced treatment for the water used on the golf courses. It is located on the same site as the WWTP, and therefore shares in all the same hazards related to coastal flooding. The facilities at the site include tertiary treatment plant facilities, a microfiltration and reverse osmosis facility, a laboratory building, and a pump station and pipeline to convey the treated water north to Pebble Beach Community Services District.

Given the shrinking water supplies the golf courses are dependent upon the reclaimed water supplies. Protection of CAWD's ability to continue providing reclaimed water is of great importance to the community. Hazard mitigation for the Reclamation Plant should focus on: Coastal Flooding, Cyber-Attack, Dam Failure, Drought & Water Shortage, Earthquake, Epidemic, Extreme Cold & Freeze,

Extreme Heat, Flash Flood, Pandemic, Riverine Flooding, Sea Level Rise, Severe Winter Storms, Terrorist Attack, Tsunami, Utility Interruption/ PSPS, Water Contamination, Wildfire, Windstorms.

N.5 DISTRICT SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the CAWD's hazards and assess the District's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the CAWD is included in this Annex.

The CAWD's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The District's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the District. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**.

Table N-1 displays the results of the hazard risk ranking exercise that was performed by the CAWD'S Planning Team.

Table N-1
Threat Hazard Identification Risk Assessment (THIRA): CAWD

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	-	-	-	-	-	-
Coastal Erosion	2.5	2	2	2	8.5	Moderate
Coastal Flooding	2.5	3	2	3	10.5	Substantial
Cyber-Attack	2	2.5	2	2	8.5	Moderate
Dam Failure	2.5	2	2	3	9.5	Moderate
Drought & Water Shortage	1.5	1	2	1	5.5	Slight
Earthquake	2.5	2	2	2.5	9	Moderate
Epidemic	1.5	1	2	1	5.5	Slight
Extreme Cold & Freeze	1.5	1	2	1	5.5	Slight
Extreme Heat	1.5	1	2	2	6.5	Possible
Flash Flood	2.5	3	2	3	10.5	Substantial
Hazardous Materials Incident	1	3	1	1	6	Slight
Invasive Species	-	-	-	-	-	-
Levee Failure	1.5	1	2	2	6.5	Possible
Localized Stormwater Flooding	2	2	2	2	8	Possible
Mass Migration	-	-	-	-	-	-

Table N-1
Threat Hazard Identification Risk Assessment (THIRA): CAWD

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Pandemic	1.5	1	2	1	5.5	Slight
Riverine Flooding	2.5	3	2	3	10.5	Substantial
Sea Level Rise	3	3	3.5	3	12.5	High
Severe Winter Storms	2	3.5	2	2	9.5	Moderate
Slope Failure	2.5	3	2	2	9.5	Moderate
Targeted Violence	-	-	-	-	-	-
Terrorism	2	2.5	2	2	8.5	Moderate
Tsunami	2.5	2	2	2	8.5	Moderate
Utility Interruption/ PSPS	2.5	2	2	2	8.5	Moderate
Water Contamination	1.5	1	2	1	5.5	Slight
Wildfire	2	2	2	2	8	Possible
Windstorms	2	2	2	2	8	Possible

N.5.1 AGRICULTURAL EMERGENCIES

The CAWD infrastructure is unlikely to experience any impacts associated with agricultural emergencies.

N.5.2 COASTAL EROSION

As part of providing wastewater collection and treatment service to a coastal community, CAWD maintains assets that are located near the coastline that are susceptible to coastal erosion.

Notable facilities susceptible to coastal erosion are:

- 8th & Scenic Pump Station - Carmel
- Bay & Scenic Pump Station - Carmel
- Conveyance Pipelines located by the coastline
- Ocean Outfall

N.5.3 DAM AND LEVEE FAILURE

Dam Failure

The San Clemente Dam was removed in 2015 thereby greatly reducing risk of dam failure for the District. However, the Los Padres Dam is another dam located upstream of the old San Clemente Dam site. The Los Padres Dam is about 25 miles upstream from CAWD facilities in the Carmel River watershed and holds up to about 3,000 acre-ft.

During development of this Hazard Mitigation Plan, CAWD did not find any reports that identify the extent of downstream impact that could occur from a failure of Los Padres Dam. It is possible that hydraulic modeling would reveal the extent of downstream impacts of a Los Padres Dam failure on

CAWD facilities. For the purposes of this report, CAWD is assuming that impacts would be similar to other flooding impacts associated with the Carmel River.

Levee Failure

There are several levees (many of which are uncertified) in the vicinity of the Carmel River Lagoon which provide little if any flood control to the CAWD treatment plant facilities located south of the Carmel River. The treatment facility site relies on the design of the process structures and site topography as flood mitigations. However, the residential and commercial developments on the north side of the river are more reliant on levees for flood protection. Therefore, the corresponding sewer collection systems associated with these developments are reliant on levee protection. The levee system along the north side of the Carmel River has been known to be vulnerable to flood impacts, and flooding in these areas north of the river could lead to inundation of flood waters into sewers, overwhelming the system and causing sanitary sewer overflows.

N.5.4 DROUGHT AND WATER SHORTAGE

Drought and water shortage can affect CAWD facilities in different ways. One way is that collections sewers can get solids build up due to lack of water flow to carry solids down the line. Another way that CAWD and the community would be affected is that CAWD provides irrigation water to all the golf courses in Pebble Beach. If inflow into the CAWD treatment plant declines due to potable water conservation, then CAWD will not have as much water to treat and send to the golf courses for irrigation. Currently the golf courses barely get by with the current water supply that CAWD provides and sometimes must purchase potable water. There could be other water resources that CAWD could take on developing to mitigate impacts of water supply shortages on the economy (such as aquifer storage and recovery, and desalination) if the regulatory environment allows it and funding is available.

N.5.5 EARTHQUAKE

CAWD facilities are designed to latest building codes to handle seismic events that are in effect at the time of construction. However, damage to multiple CAWD facilities could still occur in a large earthquake. Many facilities were originally built in the 1950s through 1970s when seismic standards were less intensive than they are today. To mitigate hazard risk more detailed review of existing facilities structures would determine how well they will withstand an earthquake so targeted improvements could be implemented. Some seismic review work has already been done on a select few structures recently, but the entire system has not been reviewed to confirm current seismic vulnerabilities.

N.5.6 FLOODING

A significant number of CAWD facilities are located in and around the Carmel River Lagoon Floodplain (a coastal floodplain). Flooding of the Carmel River Lagoon Floodplain during extreme river flow events can cause elevated water levels adjacent to the treatment plant and eventually floodwaters can enter onto the treatment plant site. This has occurred at the treatment facility in the past and has been a known hazard since before the current treatment facilities were built, thus the critical facilities were elevated and designed to operate continually during floods. Multiple less critical facilities are not as

protected from flooding including the Reclamation Plant Microfiltration and Reverse Osmosis Facility which does not have a significant freeboard over the 100-year flood elevation.

Low lying sewers in the collections system that serve the communities adjacent to the Carmel River Lagoon Floodplain are susceptible to flood impacts including damage to pump stations and infiltration of flood waters into the sewer that can cause sanitary sewer overflows (SSO).

The impacts associated with flash flooding and with riverine flooding are similar to that of coastal flooding. Sewer collection systems located throughout the CAWD service area can be impacted by localized stormwater flooding. If stormwater is not managed by the City or County, then stormwater can collect in streets and eventually find its way into the sewer system which can exceed the pipes capacity and lead to sewer overflows.

N.5.7 HAZARDOUS MATERIALS INCIDENT

CAWD utilizes numerous hazardous chemicals at the treatment plant site for wastewater and recycled water treatment processes. The hazardous materials are managed by means of regulatory and safety standards to avoid any release. The hazardous materials are protected from hazards onsite such as flooding. However, just having these materials onsite at the treatment plant comes with some level of risk and further hazard mitigation could be implemented.

Additionally, water contamination can be an issue for the wastewater treatment plant as the collection system is prone to people or businesses dumping hazardous materials or contaminants into the sewer system. CAWD is required to conduct source control of the system to identify misuse of the sewer system. However, it requires significant investment to eliminate the possibility of illicit discharges into the sewer system.

N.5.8 HUMAN CAUSED HAZARDS

CAWD is heavily reliant on information technology (IT) and computerized process automation for the operation of the collection system pump stations and the wastewater treatment plant facilities. A cyber-attack could hamper the functioning of the critical service that CAWD provides, leading to sewer backups and discharge of untreated sewage. Given the prevalence of cyber-attacks in the US, CAWD takes cyber security very seriously and hires an outside network security company to provide system security updates, surveillance, geofencing, phishing training, off site backups, and setting up software password protocols. Furthermore, in house staff is working on eliminating legacy windows computers from use on the network and has created a task force of internal staff to build a cyber security culture.

However, given the dynamic nature of IT and cyber security, and the extensive use of IT and automation by CAWD, ongoing efforts are needed to keep up with the latest security measures, and this is anticipated to become even more difficult into the future as cyber security threats become more sophisticated. Implementing ongoing technology improvements and hiring experienced cyber security experts is needed.

As critical infrastructure with a high replacement cost, CAWD facilities could be a target for terrorism. A terrorist attack could seriously jeopardize the continuous operations of sewer collections, treatment, and recycled water production. The CAWD infrastructure is unlikely to experience any impacts associated with mass migration and targeted violence.

N.5.9 PUBLIC HEALTH HAZARDS

Based on the experience of the COVID-19 pandemic, there are improvements that CAWD could make to protect employees and maintain continuous wastewater collection and treatment through a pandemic or epidemic. CAWD facilities cannot be abandoned by staff for more than a few days before the system will begin to experience failures and ultimately catastrophic failure would occur if there were no staff to operate and maintain the systems.

Social distancing, creating segregated work environments, ventilation improvements, and stockpiling Personal Protective Equipment (PPE) are all potential mitigations in the event of another pandemic/epidemic.

N.5.10 SEVERE WEATHER

Severe winter storms have the potential to create flooding issues as described in the flooding section. Furthermore, severe storms in the area often involve high winds. Being located along the coast in California, the CAWD facilities are not designed for any extended duration freeze events. If weather patterns change as a result of climate change, CAWD facilities could be stressed and fail as a result of freezing pipes and failure of electrical systems without adequate heating and insulation.

A major hazard associated with windstorms is subsequent to the hazards of trees falling over. Falling trees can result in roots pulling out of the ground, pulling sewer pipes up along with the roots. Trees surrounding the wastewater treatment facility could fall on critical infrastructure in the facility because they are located in close proximity to buildings onsite. Furthermore, windstorms can cause prolonged and serious power outages, such as could happen if a tree damages the main PG&E aerial power feed to the treatment plant which traverses through a highly wooded area.

Being located along the coast in California where the weather is typically mild, the CAWD facilities are not designed for extreme heat. Because of the typical mild weather, most temperature sensitive facilities owned and operated by CAWD do not have air conditioning systems installed. If weather patterns change as a result of climate change, CAWD facilities could be stressed and fail as a result of overheating of electrical systems without adequate cooling systems.

N.5.11 SLOPE FAILURE

Slope failure is an issue in many different locations in the CAWD collection system because the Carmel area contains hilly and steep topography. Many residential developments are located on hillsides which provide great views but locating buildings in these locations comes with infrastructure challenges. Many CAWD sewer lines were built on slopes to serve developments located in hilly areas. Pipelines on a slope can easily fail as a result of a slope failure, and as time goes on the risk of erosion and slope stability issues slowly increases.

N.5.12 TSUNAMI

According to the Tsunami Inundation Map for Emergency Planning – Monterey Quadrangle prepared July 1, 2009 by California Emergency Management Agency the following infrastructure is within, or at the edge of, the mapped tsunami hazard zone:

- West side of the CAWD Treatment Plant – mouth of Carmel River
- 8th & Scenic Pump Station - Carmel
- Monte Verde & 16th Pump Station - Carmel
- Bay & Scenic Pump Station - Carmel
- Calle la Cruz Pump Station - Carmel

One concern is preventing infrastructure from becoming inundated by a tsunami event. Furthermore, structural damage from intense wave loading could be a concern for structures within the tsunami zone.

N.5.13 UTILITY INTERRUPTION

Much of the CAWD treatment and conveyance systems are reliant on electricity to function. Critical facilities must be maintained and operational 24/7 and therefore the most critical facilities have onsite backup power. However, there are improvements that could be implemented to further fortify and maintain function of critical systems with backup power sources, and to mitigate utility interruption. For instance, the reclamation plant does not have any standby power and will not function in a power outage. Another potential hazard issue identified is that the main PG&E power line coming into the treatment facility goes through a forested area via aerial power lines. It would provide more resiliency to have the plant PG&E power come into the plant via an underground feeder.

N.5.14 WILDFIRE

The CAWD service area includes many rural areas that are susceptible to wildfire hazards. California continues to experience an increase in wildfire hazards due to climate change and an increase in excess fuel. The California Public Utilities Commission has developed a Fire Threat Map. The map identifies two tiers for fire hazards. Tier 2 is elevated fire hazard and tier 3 is extreme fire hazard.

The CAWD facilities that are the closest in proximity to tier 2 areas are listed below. Highlands pump station is in the tier 2 zone (elevated fire hazard).

- CAWD Treatment Plant – mouth of Carmel River
- Calle la Cruz Pump Station – Carmel
- Ribera Pump Station – Carmel
- Hacienda Pump Station- Carmel
- Highlands Pump Station – Carmel Highlands

N.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The CAWD wastewater treatment plant was originally designed to continue to operate during and after flood events which were known to occur at the time of the design of the existing facilities. The CAWD plant has operated through multiple flood events in the past and has been continually treating sewage on site for over 100-years.

According to a study performed by Environmental Science Associates (ESA) in December 2018 increased storm intensity as well as sea level rise will not detrimentally affect the CAWD facility before the year 2062 under the “Extreme Risk Aversion” scenario. This allows for over 40-years of continued operation in the existing location. The next 40 years will provide time for CAWD to evaluate future improvements of increasing flood resiliency at higher levels vs. potentially relocating the facility. In the near term, the sea level rise projections do not identify new hazards to the facility of greater concern than the 100-year flood risks that CAWD has planned for. However, in the long-term increased storm intensities as well as higher sea levels may increase the base flood elevations.

N.6 CAPABILITY ASSESSMENT

The District performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table N-2*
- An assessment of administrative and technical capabilities is presented in *Table N-3*
- An assessment of fiscal capabilities is presented in *Table N-4*
- An assessment of education and outreach capabilities is presented in *Table N-5*
- An overall self-assessment of capability is presented in Section N.6.1 in *Table N-6*

Table N-2
Planning and Regulatory Capability

Document, Program, Requirement	Department	Comments
General Management Plan	☒ • Engineering	Sanitary Sewer System Management Plan
Capital Improvement Plan	☒ • All	Included in annual budget – 15-year Long Term Capital Plan. Reviewed and modified annually to anticipate necessary capital projects in advance to allow time to secure funding
Stormwater Management Plan	☒ • Engineering	Stormwater Pollution Prevention Plan
Coastal Management Plan	☒ • Engineering	Coastal Hazards Monitoring Plan- establishes data collection tools to evaluate progression of local hazards related to sea level rise
Climate Action/ Adaptation Plan	☒ • Engineering	Completed Sea Level rise study in 2018. Currently reporting to Coastal Commission on changes in sea level rise at WWTP location
Emergency Operations Plan	☒ • All	Business Response Plan/Emergency Action Plan. CAWD staff are Disaster Service Workers and are trained to safely operate and maintain the critical sewer infrastructure 24/7 and during emergencies
Specific Emergency Response Plans	☒ • Safety	Business Response Plans, FAST Plan
Continuity of Operations Plan	☒ • All	Maintain 24/7 service of sewer system

Table N-2
Planning and Regulatory Capability

Document, Program, Requirement	Department	Comments
Evacuation Plan	☒ • All	
Illness and Injury Prevention Plan	☒ • Safety	Employee Safety Programs (PPE/Trainings) Confined Space Program
Business Response Plan	☒ • Safety	
Hazardous Materials Plan	☒ • Safety	Spill Prevention, Control and Countermeasure Plan Hazardous Material Plans and Training
Site Plan Review Requirements	☒ • Engineering	Performed by Plant Engineer when applicable
Other:	• Hazard Communication Program (HAZCOM) • Sanitary District Act of 1923 • CAWD Uniform Plumbing Ordinance • Lateral Permits/Building Permit Review	

Table N-3
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒ • Engineering	Plant Engineer, Principal Engineer
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒ • Engineering	Plant Engineer, Principal Engineer
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒ • Engineering	Plant Engineer, Principal Engineer
Building Inspector	☒ • Engineering • Source Control	Plant Engineer, Principal Engineer
Emergency Manager	☒ • Safety	General Manager, Safety & Compliance Officer
Resource development staff or grant writers	☐	
Public Information Officer	☒ • Admin	Duty performed by General Manager
Scientist(s) familiar with the hazards of the community	☐	
Staff with education or expertise to assess the	☒ • Engineering • Safety	Plant Engineer, Principal Engineer, Safety & Compliance Officer

Table N-3
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
community's vulnerability to hazards			
Personnel skilled in Geographic Information Systems (GIS)	☒	Engineering	Plant Engineer, Principal Engineer, also maintains a contract with Turf Image for GIS services
Maintenance programs to reduce risk	☒	- Engineering - Maintenance - Collections	Plant Engineer, Principal Engineer, Collection Superintendent
Warning systems/services	☒	- Engineering - Maintenance - Collections	CAWD SCADA System/CAWD Website
Mutual Aid Agreements	☐		No written agreements currently in place; however, several Informal connections with other nearby water and wastewater utility providers
Other:		Safety Committee- Safety Regulatory Compliance Administrator / Operations / Maintenance / Engineering	

Table N-4
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	Finance	Principal Accountant, General Manager
Capital Improvements Project Funding	☒	Finance	Principal Accountant, General Manager, Funding associated with a CIP would also have a Project Manager. \$3.3 million per year in capital improvement projects to ensure the continued safe, hazard-resilient wastewater and water recycling services to CAWD's service area.
Special Purpose Taxes	☐		
Stormwater Utility Fees	☐		
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☒	Finance	All sewer utility fees collected are used in the operation and maintenance of CAWD's infrastructure. This includes CIP projects and maintenance functions which extend useful life.
Development Impact Fees	☐		
General Obligation Bonds	☐		
Special Tax and Revenue Bonds	☐		

Table N-5
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, etc.	☒ • Manager • Safety	CAWD participates in peninsula wide Fats, Oils, and Grease Program
Ongoing public education or information program	☒ • Manager • Safety • Collections	Educating the public about the valuable services provided by CAWD and how these relate to public health, environmental protection, and drought resiliency in the District's service area. Multiple platforms for customer and constituent interaction with CAWD, which increases the ease of reporting concerns resulting in quicker incident response times and in some cases, incident prevention. Provides annual tours to local schools. Via cawd.org , educators can access educational resources for their students and interested citizens can learn more about topics like best management practices for household hazardous waste and sewer maintenance, both of which reduce the occurrences of accidental exposure and/or sanitary sewer overflows.
Natural disaster or safety related school programs	☒ • Safety	
Public-private partnership initiatives addressing disaster-related issues	☐	
Other:	Ongoing training for employees and contractors performing work for CAWD on prevention and mitigation of occupational hazard incidents and control of hazardous materials and other environmental pollutants	

Political Capability

The CAWD Board is very willing to engage on issues related to sanitary sewer systems and treatment facilities. They have begun working on Sea Level Rise and the impact on their facilities.

N.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The Carmel Area Wastewater District is a Special District and is therefore not eligible for flood insurance under the National Flood Insurance Program (NFIP).

N.6.2 SELF-ASSESSMENT OF CAPABILITY

Table N-6
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	High
Fiscal Capability	High
Education and Outreach Capability	High
Political Capability	High
Overall Capability	High

N.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

CAWD does an excellent job as a Special District, but their jurisdiction is limited to sanitary sewer issues. Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

N.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the District made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The District will strive to ensure consistency between the hazard

mitigation plan and the current and future capital improvement plan. The hazard mitigation plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.

- **Sanitary Sewer System Management Plan:** State regulatory requirement to ensure efforts are made to reduce risks to public health, property and the environment
- **Coastal Hazards Monitoring Plan:** This plan establishes data collection tools to evaluate progression of local hazards related to sea level rise
- **Sea Level Rise Study:** Analysis of the possible effects of sea level rise changes at WWTP location.
- **Business Response Plan/Emergency Action Plan:** CAWD staff are Disaster Service Workers and are trained to safely operate and maintain the critical sewer infrastructure 24/7 and during emergencies.

Opportunities for Future Integration

As this hazard mitigation plan is implemented, the Carmel Area Wastewater District will use information from the plan as the best available science and data on natural hazards. The capability assessment presented in this annex identifies codes, plans and programs that provide opportunities for integration. The area-wide and local action plans developed for this hazard mitigation plan include actions related to plan integration, and progress on these actions will be reported through the progress reporting process described in **Volume 1**. New opportunities for integration also will be identified as part of the annual progress report. The plans and programs listed in the Capability Assessment cover the majority of District operations where the hazard mitigation goals are addressed. However, the capability assessment identified the opportunity for future integration of recommendations of the hazard mitigation plan for all the plans and programs listed as they are updated periodically

N.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the Districts' Planning Committee identified key vulnerabilities and hazards of concern. The Hazard Problem Statements were primarily derived from CAWD's Hazard Mitigation Planning Committee and informed by review of existing literature about CAWD's assets and analysis using best available data relating to the vulnerability analysis for each piece of CAWD's critical infrastructure. They were developed to assist in the identification and analysis of potential hazard mitigation actions for CAWD.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the District are identified below:

N.7.1 COLLECTIONS SYSTEM

- Infrastructure requires capital investment to ensure safe, reliable sewer collections services.
- Collection's systems must operate continuously (24/7) as wastewater doesn't stop flowing.
- Infrastructure is coastally located and thus vulnerable to sea-level rise, tsunami, coastal erosion, coastal flooding, and intense storm events.

- The CAWD collection system is located in areas with a high level of environmental scrutiny and regulation. This makes completing projects more difficult due to the many regulatory requirements for doing projects even though they are necessary to maintain the sewers in good condition and improve resiliency of the system from hazards.
- Conservation in CAWD's service area is reducing the amount of flow in sewers to move solids down gravity pipelines.
- Extending sewer collection service to remote areas of District which were originally developed by means of septic tanks.

N.7.2 WASTEWATER TREATMENT PLANT

- Infrastructure requires capital investment to ensure safe, reliable wastewater and water recycling services.
- Treatment systems must operate continuously (24/7) as wastewater doesn't stop flowing.
- Infrastructure is coastally located and thus vulnerable to sea-level rise, tsunami, coastal erosion, coastal flooding, and intense storm events.
- Conservation in CAWD's service area is changing the characteristics of wastewater.
- New regulations in the future could require changes in treatment process.

N.7.3 RECLAMATION PLANT (RECYCLED WATER FACILITIES)

- Infrastructure requires capital investment to ensure safe, reliable water recycling services.
- Recycled water supply is largely dependent on resources that fluctuate with rainfall and are heavily influenced by conservation trends.
- Infrastructure is coastally located and thus vulnerable to sea-level rise, tsunami, coastal erosion, coastal flooding, and intense storm events.

N.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The Carmel area is vulnerable to a wide range of hazards, both natural and manmade, which threaten the life and safety of residents and visitors. While complete elimination of the hazards facing CAWD's infrastructure is not likely, adequate, proactive planning and preparation for such occurrences can greatly reduce the impact on the communities, environments, and economies it serves.

The District's Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the District's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Plan Action Plan Matrices lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Table N-8 contains the Hazard Mitigation Plan Action Plan for the CAWD Collection System and *Table N-9* contains the Hazard Mitigation Plan Action Plan for the CAWD WWTP and Reclamation Plant.

Status of Previous Plan Actions

CAWD has experienced infrastructure damage from natural disasters in the recent past. The “Hatton Canyon Pipeline Replacement Project” was completed recently, and the work was funded through Cal OES hazard mitigation grant funding. CAWD is proven capable of successfully implementing hazard mitigation grant funds.

Table N-8
CAWD Collection System Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
1	3 – 5 years	Gravity Sewer - Carmel Meadows	Slope Failure, Earthquake, Water Contamination	- Relocate the pipeline off the slope. - Improve stability of slope via shoring or retaining walls. - Install seamless pipe so joints don't fail. - Install anchorage to keep pipe from sliding.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
2	3 – 5 years	Gravity Sewer - Pescadero Creek	Slope Failure, Earthquake, Water Contamination	- Relocate the pipeline off the slope. - Improve stability of slope via shoring or retaining walls. - Install seamless pipe so joints don't fail. - Install anchorage to keep pipe from sliding.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
3	3- 5 years	Scenic Rd Sewer Lines	Coastal Erosion, Sea Level Rise, Earthquake	- Relocate pipes farther inland. - Replace pipe with seamless pipe so it is less susceptible to failure at pipe joints.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
4	As Needed	Pump Station – Calle La Cruz	Flooding, Riverine Flooding, Sea Level Rise, Flash Flood, Slope Failure	Relocate the Pump Station to higher ground or retrofit the pump station to handle higher flood levels and slope erosion.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-8
CAWD Collection System Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
5	As Needed	Pump Station - Monte Verde and 16 th	Coastal Flooding, Sea Level Rise, Flash Flood, Levee Failure, Storm Water Flooding, Dam Failure	- Waterproof the station structure and wet well. - Install flood walls. - Increase Pump Station size to handle flood inflows. - Relocate electrical panels away from flood impacts.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
6	3 – 5 years	Pump Station - Bay and Scenic	Coastal Erosion, Sea Level Rise, Tsunami	- Pump Station Retrofit to handle new conditions caused by Sea Level Rise. - Relocate Pump Station Inland or eliminate Pump Station by requiring homes to install residential sewer pumps stations. - Move electrical panels to higher ground.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
7	As Needed	Pump Station – 8 th and Scenic	Coastal Erosion, Sea Level Rise, Tsunami	- Pump Station Retrofit to handle new conditions caused by Sea Level Rise. - Relocate Pump Station Inland or eliminate Pump Station by requiring homes to install residential sewer pump stations. - Move electrical panels to higher ground.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
8	As Needed	All Pump Stations	Utility Interruption/ Public Safety Power Shutoff, Windstorms	- Pre-position emergency power generation capacity (or have rental/lease agreements for generators) in critical locations for continuity services. - Install 480V battery backup systems. - Purchase a new engine driven bypass pump for Highlands Pump Station.	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-8
CAWD Collection System Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
9	As Needed	All Pump Stations	Cyber-Attack	• Upgrade network hardware and software. • Build a standby / backup server. • Encrypting internal control system network. • Hire network security firm to implement security improvements. • Hire network security firm to monitor network and manage security.	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
10	As Needed	All Pump Stations	Earthquake	• Commission a structural analysis of the most critical pump stations. • Complete structural modifications for earthquake safety as necessary.	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
11	In Progress	Low lying sewers in Carmel Point and Mission Fields	Flooding, Flash Flood, Levee Failure, Sea Level Rise, Localized Stormwater Flooding, Tsunami	• Install watertight manhole lids to mitigate inflow. • Install seamless piping to mitigate infiltration. • Repairing manholes structures and/or lining them to mitigate infiltration.	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-8
CAWD Collection System Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
12	3 – 5 years	Low lying sewers around Rio Rd East of Hwy 1)	Riverine Flooding, Coastal Flooding, Flash Flood, Levee Failure, Sea Level Rise, Localized Stormwater Flooding, Dam Failure	• Install watertight manhole lids to mitigate inflow. • Install seamless piping to mitigate infiltration. • Repairing manholes structures and/or lining them to mitigate infiltration.	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
13	As Needed	Sewer Lines on Slopes Greater than 2:1	Slope Failure	• Conduct detailed geological investigations of facilities to determine the risk of damage from slope instability. • Improve stability of existing slope via shoring or retaining walls. • Install seamless pipe so joints don't fail. • Install anchorage to keep pipe from sliding.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-8
CAWD Collection System Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
14	Ongoing	All Sewer Lines	Severe Winter Storms, Localized Stormwater Flooding	- Continue to repair/replace and make structural improvements to pipelines to enable them to perform to their design capacity. - Televising gravity interceptors to identify structural and joint problems and verify the condition - Continue maintenance efforts to keep pipelines free of obstructions.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
15	As Needed	All Sewer Lines	Drought & Water Shortage	- Expand in-situ sewer cleaning capabilities to increase frequency of cleaning to avoid backups due to poor solids conveyance. - Purchase a cleaning truck that recycles cleaning water in the truck to use less water during cleaning. - Expand sewer system to collect septic tank water.	Low	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
16	Ongoing	Sewer Manholes	Severe Winter Storms, Localized Stormwater Flooding	- Replace or repair deficient manholes to reduce infiltration. - Ongoing inspections. - Install watertight lids	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
17	As Needed	All Pump Stations	Extreme Cold & Freeze	Review electrical control systems for major stations to determine if enough independent operations exist between each control system to ensure single system failure cannot disable the station.	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-8
CAWD Collection System Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
18	As Needed	All Pump Stations	Extreme Heat	- Review electrical control systems for major stations to determine if enough independent operations exist between each control system to ensure single system failure cannot disable the station. - Install odor control / hazardous sulfide gas control. - Add Air Conditioning to cool electrical panels. - Purchase an engine driven bypass pump for Highlands Pump Station.	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
19	3 – 5 years	Highlands Pump Station	Wildfire	Purchase an engine driven bypass pump for Highlands Pump Station.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
20	Ongoing	Personnel	Pandemic, Epidemic	- Establish formal mutual aid agreements. - Install provisions for social distancing employees.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
21	Ongoing	Critical Supplies	Pandemic, Epidemic	Construct or otherwise obtain additional storage facilities to stockpile necessary supplies that may be disrupted during a global pandemic.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-8
CAWD Collection System Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
22	As Needed	All Sewer Lines not under streets	Windstorms	Remove trees with roots that may intrude under sewer lines. Trees fall over in the wind and can pull sewers out of the ground with the roots ball.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
23	Ongoing	Sewer lines near waterbodies or storm drains	Water Contamination (i.e., protection of natural waters)	- Seal manholes and sewer lines to limit exfiltration. - Replace pipes and manholes - Map all storm drains in the District to plan containment strategies near storm inlets in event of sewer overflow.	High	Collections	General Fund, Grants, HMGP, CIP, Utility Fees
24	As Needed	Collections Office and Vehicle Storage Building	Coastal Flooding, Riverine Flooding, Sea Level Rise, Flash Flood	Relocate collections offices and vehicle storage to a new location away from the flood plain.	Medium	Collections	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-9

CAWD Wastewater Treatment Plant and Reclamation Plant Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
1	As Needed	Ocean Outfall Pipeline	Coastal Erosion	Install a new Outfall deeper underground	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
2	Ongoing / As Needed	Wastewater Treatment and Reclamation Plant	Riverine Flooding, Coastal Flooding, Flash Flood, Dam Failure	- All new construction within the 100-year flood zone to be completed with design that will limit damage from floods. - Adapt existing structures to handle higher/more frequent floods onsite. - Relocate treatment plant. - Install area groundwater dewatering pumps. - Pump floodwaters to a new aquifer storage well system offsite.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
3	Ongoing / As Needed	Treatment Plant Access Road	Riverine Flooding, Coastal Flooding, Flash Flood, Dam Failure	- Provide secondary access into the treatment plant by replacing or renovating existing CAWD pedestrian bridge over Carmel River. - Relocate treatment plant.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-9

CAWD Wastewater Treatment Plant and Reclamation Plant Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
4	Ongoing	Wastewater Treatment and Reclamation Plant	Cyber-Attack	- Upgrade network hardware. - Build a standby / backup server. - Upgrade network software. - Encrypting internal control system network. - Hire network security firm to implement security improvements. - Hire network security firm to monitor network and manage security.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
5	As Needed	Wastewater Treatment and Reclamation Plant	Drought & Water Shortage	Install a smaller blower/aerator.	Low	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
6	As Needed	Reclamation Plant	Drought & Water Shortage	- Implement an Aquifer Storage and Recovery project to maximize water recycling during wet weather flows. - Add ocean desalination capabilities for water resources. - Expand dry weather stormwater diversions into sewer system.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
7	As Needed	Wastewater Treatment and Reclamation Plant	Earthquake	- Commission a structural analysis of critical structures ability to withstand earthquakes. - Retrofit existing structures as necessary.	Medium	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-9

CAWD Wastewater Treatment Plant and Reclamation Plant Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
8	Ongoing / As Needed	Wastewater Treatment and Reclamation Plant	Pandemic, Epidemic	- Install new separate workspaces to replace communal workspaces to allow social distancing. - Upgrade Process Automation. - Add onsite housing for staff to maintain facility without contact to outside. - Add ventilation improvements to treat airborne vectors (HEPA, UV light, Ozone, etc.).	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
9	As Needed	Wastewater Treatment and Reclamation Plant	Extreme Cold & Freeze	- Insulate exposed piping. - Enclose the MF/RO Reclamation Facility.	Medium	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
10	As Needed	Wastewater Treatment and Reclamation Plant	Extreme Heat	Add Air Conditioning to cool electrical panels and PLC panels.	Medium	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
11	Ongoing	Wastewater Treatment and Reclamation Plant	Hazardous Materials Incident	Provide training to employees in the handling, storage, and control of hazardous materials.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-9

CAWD Wastewater Treatment Plant and Reclamation Plant Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
12	Ongoing / As Needed	Wastewater Treatment and Reclamation Plant	Sea Level Rise	- Adapt existing structures to handle higher and more frequent floods onsite. - Relocate treatment plant.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
13	Ongoing	Wastewater Treatment Plant	Severe Winter Storms	- Maintain treatment plant conveyance capacity to handle large wet weather flows. - Invest in collections system improvements to reduce infiltration and inflow during wet weather. - Invest in additional flow equalization facilities (i.e., storage) onsite and/or offsite.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
14	Ongoing / As Needed	Wastewater Treatment and Reclamation Plant	Terrorist Attack	- Install more security cameras. - Install a secure fence around the site. - Hire a specialist to do a threat vulnerability risk assessment for infrastructure. - Hire a security firm to monitor site outside normal business hours. - Underground the main PG&E overhead power line from Rio Rd to the Treatment Plant site.	Medium	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-9

CAWD Wastewater Treatment Plant and Reclamation Plant Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
15	As Needed	Wastewater Treatment and Reclamation Plant	Tsunami	Commission a structural analysis of critical structures ability to withstand tsunami and retrofit existing structures as necessary.	Low	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
16	As Needed	Ocean Outfall Pipeline	Tsunami	Install a new Outfall deeper underground.	Low	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
17	As Needed	Wastewater Treatment and Reclamation Plant	Utility Interruption/ Public Safety Power Shutoff	- Underground the main PG&E overhead power line from Rio Rd to the Treatment Plant site. - Install standby power system (backup generators) for Reclamation Plant. - Install battery backup system. - Increase diesel fuel storage capabilities. - Provide for standby power generation capacity using natural gas. - Add a redundant Internet Service Provider (ISP).	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
18	As Needed	Wastewater Treatment and Reclamation Plant	Water Contamination	- Hire a dedicated Source Control employee to investigate pollutants entering sewer system. - Implement more upstream sampling equipment and analysis to enable better Source Control. - Create a Source Control GIS database.	Medium	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees

Table N-9

CAWD Wastewater Treatment Plant and Reclamation Plant Hazard Mitigation Action Plan Matrix

Action #	Timeframe	Asset / Location	Hazard Mitigated	Potential Mitigation	Ranking / Prioritization	Administering Department	Potential Funding
19	As Needed	Wastewater Treatment and Reclamation Plant	Wildfire	- Underground the main PG&E overhead power line from Rio Rd to the Treatment Plant site. - Provide greater setback between treatment plant structures and tall eucalyptus trees used to hide treatment plant from public view.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees
20	As Needed	Wastewater Treatment and Reclamation Plant	Windstorms	- Underground the main PG&E overhead power line from Rio Rd to the Treatment Plant site. - Provide greater setback between treatment plant structures and tall eucalyptus trees used to hide treatment plant from public view.	High	Treatment	General Fund, Grants, HMGP, CIP, Utility Fees

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ANNEX O: MONTEREY ONE WATER



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



Monterey
One Water

O. MONTEREY ONE WATER

O.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

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O.2 AGENCY PROFILE

O.2.1 LOCATION AND SERVICE AREA

Monterey One Water (M1W), formerly Monterey Regional Water Pollution Control Agency is a Joint Powers Authority (JPA) that provides wastewater and water recycling services to 11 member entities situated in the Monterey Bay Area. The Agency receives wastewater from the following areas:

- Boronda County Sanitation District
- Castroville Community Services District
- Del Rey Oaks
- Salinas
- Seaside
- Marina Coast Water District
- Unincorporated Areas of Monterey County
- Monterey
- Pacific Grove
- Sand City

M1W's service area encompasses 90.5 square miles and includes the operation and maintenance of a vast network of infrastructure and assets, most principally: the Regional Treatment Plant (RTP); pump stations; gravity and force mains; land/ocean outfall; the Salinas Valley Reclamation Project (SVRP); Castroville Seawater Intrusion Project (CSIP); Salinas River Diversion Facility (SRDF); and Pure Water Monterey (PWM) Advanced Water Purification Facility (AWPF) and Injection Well Facilities (IWF).

O.2.2 HISTORY

Before M1W's establishment, every community in the Monterey Bay area had its own wastewater treatment plant. Most of the communities were discharging their sewage into the Monterey Bay with limited treatment and, in some cases, as little as 300 feet offshore. In 1972, the United States enacted the Federal Clean Water Act which protects against water pollution and regulates discharging of pollutants into waters of the US. This set of policies required communities to collaborate to increase treatment standards and bring regional efficiency to sewer system management.

A JPA formed the "Monterey Peninsula Water Pollution Control Agency" in 1972 by the Cities of Monterey, Pacific Grove, and the Seaside County Sanitation District. Its purpose was to seek joint solutions to water pollution. The membership has grown to include the cities of Seaside, Del Rey Oaks, Sand City, Salinas, Castroville County Sanitation District, Boronda County Sanitation District, County of

Monterey, Marina Coast Water District, and Fort Ord (ex-officio member). To reflect the larger service area, the name was changed to Monterey Regional Water Pollution Control Agency 1979. Construction of the RTP, owned and operated by the Agency, was completed in 1990 with an average dry weather design capacity of 29.6 million gallons per day (MGD).

In addition to Federal Clean Water Act requirements, it became evident during the early 1970s that the quality of northern Monterey County's groundwater supply was deteriorating due to extensive withdrawal for agricultural purposes. This overdraft increased seawater intrusion, which threatened the multibillion-dollar agricultural industry and the drinking water supply for the City of Salinas. It also presented an opportunity for water recycling to introduce new water supplies for the community. Under a 1996 agreement with the Monterey County Water Resources Agency (MCWRA), the Agency constructed the 29.6 MGD SVRP to provide recycled water to growers in the Salinas Valley and to slow seawater intrusion. The distribution portion of the system, known as the CISP, delivers water through 45 miles of pipeline to 12,000 acres of farmland in the northern Salinas Valley nearly year-round.

Recently, to address state-ordered cutbacks in utilization of existing surface water supplies on the Monterey Peninsula, M1W, in partnership with the Monterey Peninsula Water Management District (MPWMD), developed the Pure Water Monterey Groundwater Replenishment Project (PWM/GWR) to inject 3,500 acre-feet per year (AFY) of purified recycled water to replenish the Seaside Groundwater Basin. The PWM/GWR Project will also provide recycled water for landscape irrigation in partnership with Marina Coast Water District (MCWD). The project includes an Advanced Water Purification Facility with a design capacity of 5 MGD, located adjacent to the RTP. The AWPFF consists of ozone pre-treatment, low pressure membrane filtration, Reverse Osmosis (RO), advanced oxidation, and product water stabilization. Purified recycled water from the AWPFF is conveyed by pipeline to the Seaside Groundwater Basin for recharge using both deep injection and vadose zone wells. The injected purified recycled water subsequently mixes with native groundwater and is stored for future urban use, including use as a potable water source.

O.2.3 GOVERNING BODY FORMAT

M1W is a public utility serving jurisdictions in northern Monterey County. The Agency is governed through a JPA. Each of the 11 member entities appoint a representative to the M1W Board of Directors to represent their jurisdictions. Current membership on the M1W Board includes elected officials from eight jurisdictions, a representative from the Monterey County Board of Supervisors, one member who is appointed by the Monterey County Board of Supervisors to represent the Boronda County Sanitation District, and an ex-officio representative from the US Army.

O.3 PLANNING PROCESS

M1W followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the Agency formulated their own internal planning team to support the broader planning process.

M1W held a Hazard Mitigation Plan Stakeholder meeting on July 28, 2021 to discuss vulnerabilities, mitigation activities that had occurred since the last plan update, key problem statements, and mitigation strategies.

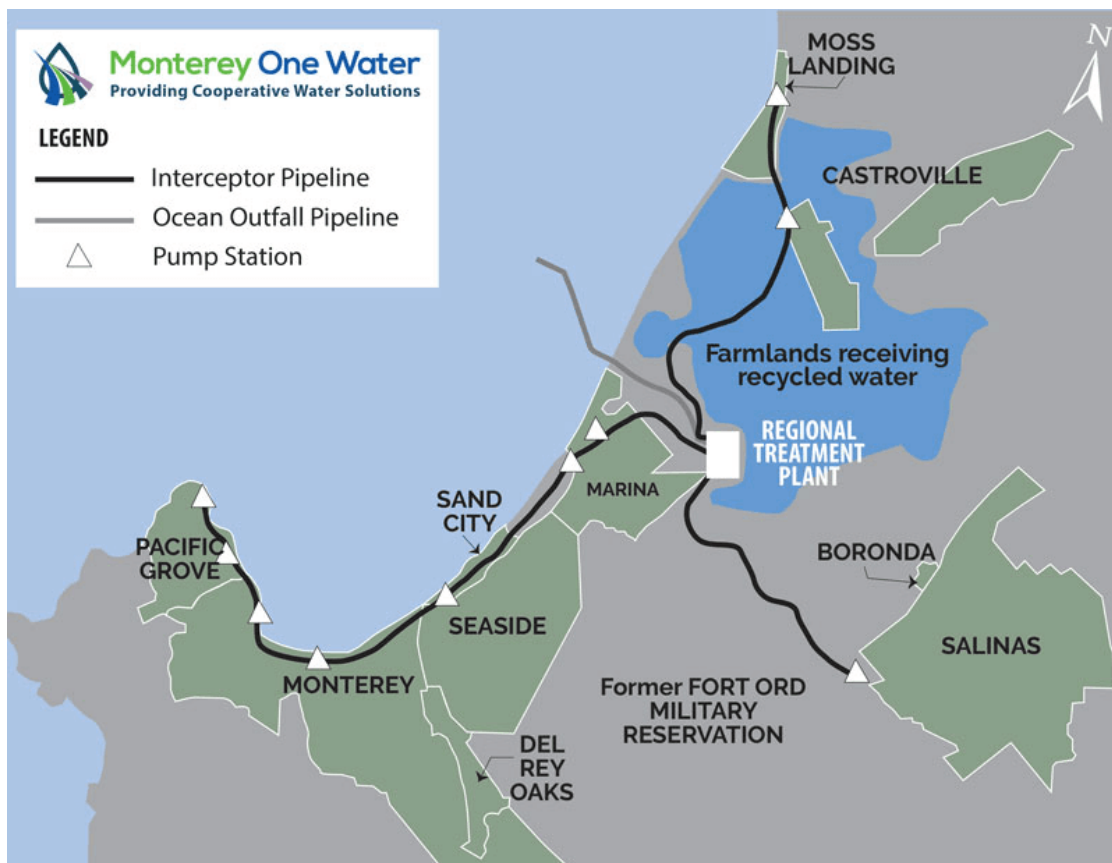
Key stakeholders present at the meeting included:

- Tamsen McNarie, Assistant General Manager
- Jennifer Gonzalez, P.E., Engineering Manager
- Jose O. Guzman, Chief Plant Operator
- Jonathan Mungcal, Utilities and Maintenance Services Manager
- Joanne Le, Laboratory and Environmental Services Manager
- Darrele Harris, Utilities Supervisor
- David Bradley, Operations Supervisor
- Nathan Clark, Operations Supervisor
- Sarah Stevens, Compliance Analyst

O.4 FACILITIES

As mentioned previously, M1W's facilities and infrastructure include: The RTP; pump stations; gravity and force mains; land/ocean outfall; the SVRP; CSIP; Salinas River Diversion Facility (SRDF); and PWM AWPf and IWF. Monterey One Water's facilities are mapped in *Figure O-1*.

Figure O-1
Monterey One Water Facilities Map



M1W owns, operates, and maintains the RTP, located two miles north of the City of Marina and provides 'trunk line' wastewater conveyance services via a system of 14 M1W-owned pump stations

and 34.2 miles of force main and gravity pipeline (referred to collectively as the wastewater collection system, WCS). Additionally, M1W operates, under contract, 18 pump stations owned by its member entities. Wastewater within M1W's service area is collected through City owned, operated, and maintained sewer systems and conveyed to regional pump stations for subsequent conveyance to the RTP. This network allows M1W to treat and recycle on average 18.5 MGD from 268,000 constituents (2010 census). Secondary treated effluent not utilized for recycling is discharged to the Bay through M1W's outfall (land/ocean outfall), which consists of 2.5 miles of land and 2.1 miles of ocean pipeline.

The M1W-owned WCS includes three 'trunk line' interceptor systems and two river crossings. Each trunk line consists of a single pipeline, ranging in size from 6 to 60 inches in diameter that were constructed in several stages about 35 years ago. Line composition includes ductile iron; polyvinyl chloride pipe (PVC); high density polyethylene pipe (HDPE); vitrified clay pipe (VCP); reinforced concrete pipe (RCP); both lined and unlined concrete pipe. There are also 39 intermittent air/vacuum relief valves. Operating pressures vary from several hundred feet of head on the discharge side of large pump stations to un-pressurized gravity flows depending on system hydraulics. M1W's WCS joins member entity sewer systems at influent manholes of the corresponding pump stations.

In 2018 M1W completed a comprehensive study (Conveyance System Condition Optimization Analysis) to assess the condition of its pump stations and WCS infrastructure, identify near-term risks and mitigation strategies, and support a long-term asset management program that identifies sustainable funding needs for a 22-year planning horizon (2019-2040). Results of the study have been incorporated into M1W's Capital Improvement Plan (CIP) Master Plan as necessary. A similar study is planned to assess the condition of the RTP.

As part of the Agency's strategic goal to develop the use of recycled water within its service area, M1W has embraced the 'one water' approach which views all waters, drinking water, wastewater, stormwater, greywater, and others, as a resource that must be sustainably managed. Subsequently, in 2018 the Agency changed its name to Monterey One Water to reflect this principal. To that end, M1W jointly owns and operates two water recycling projects: one producing recycled water to supplement agricultural reliance on groundwater in the Salinas Valley, and one purifying water to drinking water standards for indirect potable reuse via groundwater replenishment on the Monterey Peninsula.

Agricultural Reuse

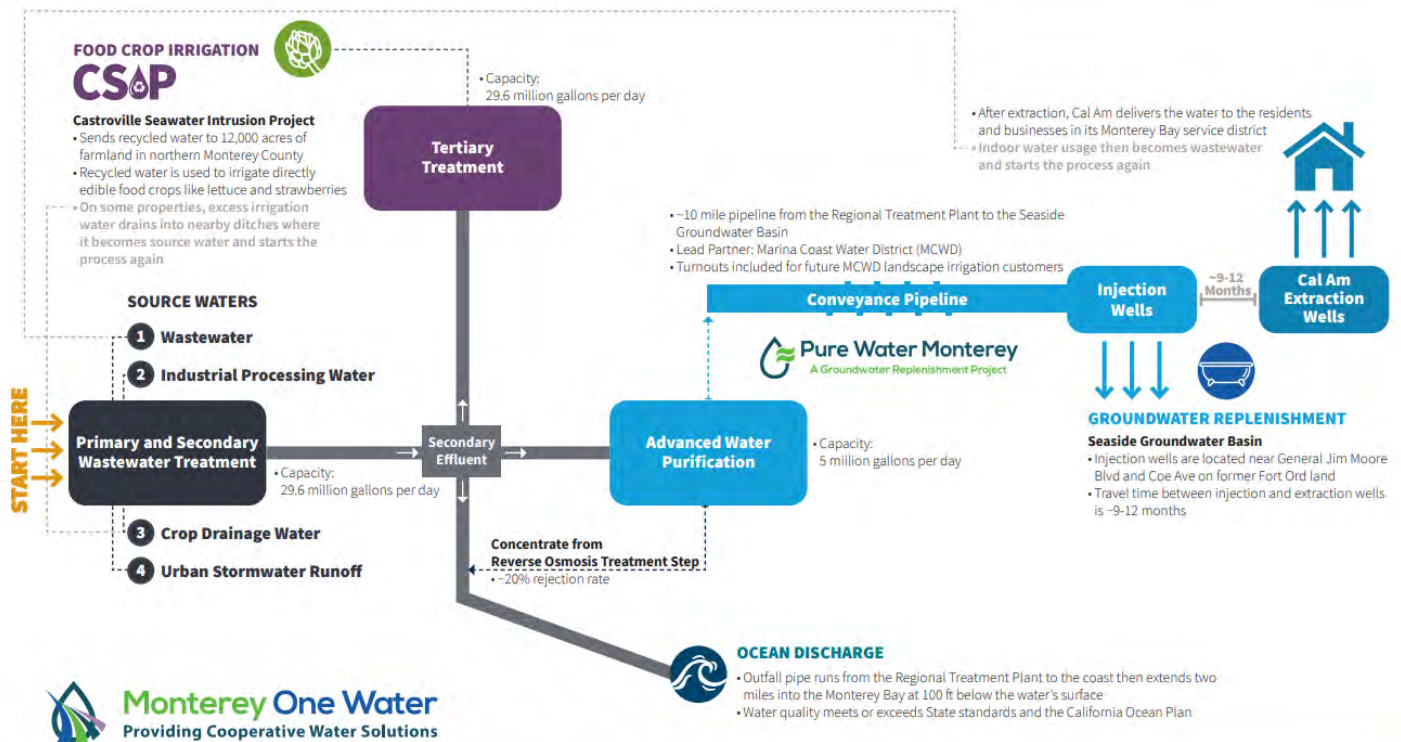
In 1992, M1W and the MCWRA formed a partnership to build the Monterey County Reclamation Projects (MCWRP): the SVRP recycled water plant and the CISP distribution system. Some years later in 2010, M1W and MCWRA again partnered to expand the MCWRP to include the SRDF to provide treated (filtered and chlorinated) river water for blending with SVRP recycled water when adequate releases from upstream reservoirs are available. These three facilities, paid for by Salinas Valley agricultural growers and property owners, provide irrigation water to 12,000 acres of Castroville farmland to assist in slowing seawater intrusion into local groundwater aquifers. Seawater intrusion threatens both agricultural water supply as well as urban/municipal drinking water supplies.

Indirect Potable Reuse and Groundwater Replenishment

Monterey County is isolated from state and federal water projects requiring the region to rely solely on its limited, local water resources. For Monterey Peninsula residents and businesses, water historically came from two sources: 1) the Carmel River and 2) the Seaside Groundwater Basin. Overuse

threatened water quality and habitats, leading to state and court-ordered reductions in reliance upon these resources. To help address this challenge, M1W and its partners collaborated to develop a drought-resistant and independent water supply: Pure Water Monterey. Using a proven, multi-stage treatment process, the PWM AWPf treats wastewater into a safe, reliable, and sustainable water supply that complies with or exceeds strict state and federal drinking water standards. After production, the purified water is conveyed to the Seaside Groundwater Basin for injection, groundwater replenishment, and eventual potable reuse.

Figure O-2
Monterey One Water Process



ONE WATER PROCESS

O.5 AGENCY SPECIFIC RISK ASSESSMENT

The intent of this section is to profile M1W's hazards and assess the Agency's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the M1W is included in this Annex.

The M1W Planning Team used the same risk assessment process as the Monterey County Steering Committee. The Agency's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the Agency. Each variable was scored by

MONTEREY ONE WATER Multi-Jurisdictional Hazard Mitigation Plan

hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**. *Table O-1* displays the results of the hazard risk ranking exercise that was performed by the M1W Planning Team.

Table O-1
Threat Hazard Identification Risk Assessment (THIRA): Monterey One Water

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	3.0	3.0	2.0	3.0	11.0	High
Coastal Erosion	4.0	3.0	2.0	4.0	13.0	High
Coastal Flooding	2.0	2.0	2.0	3.0	9.0	Moderate
Cyber-Attack	4.0	3.0	3.0	4.0	14.0	High
Dam Failure	2.0	1.0	3.0	3.0	9.0	Moderate
Drought & Water Shortage	4.0	4.0	2.0	3.0	13.0	High
Earthquake	4.0	2.0	2.0	3.0	14.0	High
Epidemic	4.0	2.0	1.0	2.0	9.0	Moderate
Extreme Cold & Freeze	1.0	1.0	1.0	1.0	4.0	Low
Extreme Heat	3.0	2.0	2.0	2.0	9.0	Moderate
Flash Flood	2.0	1.0	3.0	3.0	9.0	Moderate
Hazardous Materials Incident	2.0	2.0	2.0	2.0	8.0	Low
Invasive Species	1.0	1.0	1.0	1.0	4.0	Negligible
Levee Failure	-	-	-	-	-	-
Localized Stormwater Flooding	2.0	2.0	2.0	3.0	9.0	Moderate
Mass Migration	-	-	-	-	-	-
Pandemic	4.0	2.0	1.0	2.0	9.0	Moderate
Riverine Flooding	2.0	1.0	3.0	3.0	9.0	Moderate
Sea Level Rise	4.0	3.0	2.0	4.0	13.0	High
Severe Winter Storms	4.0	3.0	3.0	4.0	14.0	High
Slope Failure	1.0	3.0	2.0	3.0	9.0	Moderate
Targeted Violence	1.0	1.0	4.0	3.0	9.0	Moderate
Terrorism	4.0	3.0	3.0	4.0	14.0	High
Tsunami	4.0	3.0	2.0	4.0	13.0	High
Utility Interruption/ PSPS	4.0	3.0	1.0	3.0	11.0	Moderate
Water Contamination	4.0	2.0	4.0	4.0	14.0	High
Wildfire	1.0	1.0	1.0	1.0	4.0	Low
Windstorms	4.0	3.0	3.0	4.0	14.0	High

Note: Asterisks (*) indicate infrastructure jointly owned or operated by M1W with partner entities.

O.5.1 AGRICULTURAL EMERGENCIES

The following M1W infrastructure has the potential to impact agricultural emergencies or be impacted by an instance of agricultural emergency, including drought and bio-contamination.

- SVRP- Del Monte Boulevard, Marina
- CSIP- Castroville*
- SRDF- Salinas River, Marina*
- Castroville Pump Station- Highway 1 North, Castroville
- Salinas Pump Station- Hitchcock Road, Salinas
- Farmworker Housing Pump Station #1 – Hitchcock Road, Salinas
- Pond 3 Pump Station – South Davis Road, Salinas *
- Pipeline- 13.08 miles

Conjunctively the SVRP, the CSIP, and the SRDF provide recycled water to irrigate 12,000 acres of agricultural land in the Castroville area to supplement groundwater pumping with the intent to slow rates of seawater intrusion. As M1W and partner agency, MCWRA, recently observed, prolonged drought conditions adversely the impact the ability of these projects to perform their intended function. Principally, the SRDF remained non-operational during the drought from 2013 to 2016 due to limited in-stream flows for biological species downstream of the dam. This resulted in increases in groundwater pumping from supplemental wells in the area of seawater intrusion impact. However, since 1998 the projects have recycled more than 90 billion gallons of water for beneficial reuse. Should these services be interrupted again for an extended period, the 12,000 acres of crops would require an alternative water source, likely groundwater. This could result in worsened seawater intrusion into coastal aquifers which would potentially render agricultural land unfarmable.

M1W customers achieved remarkably high-water conservation benchmarks during this most recent drought period, resulting in less influent to the RTP for reclamation. In addition to reducing the volume of influent to the RTP, conservation has also changed the characteristics of the wastewater, possibly due to longer in-pipe retention times and higher concentrations. M1W is performing analyses and pursuing system-wide optimization to better understand and, where possible, adapt to the changing nature of wastewater.

The Castroville Pump Station, the Salinas Pump Station, and the Farmworker Housing Pump Station #1 are located directly adjacent to agricultural operations. If a sanitary sewer overflow (SSO) were to occur at one of these stations, wastewater could contaminate land, requiring bioremediation. M1W's preventative maintenance program (PMP) and CIP jointly work to reduce this risk by performing routine maintenance and system upgrades/replacements. Concurrently, M1W's Supervisory Control and Data Acquisition (SCADA) system monitors pump stations and sends critical feedback to the Control Room at the RTP, which is manned 24 hours a day, 365 days a year. SCADA alarms alert M1W employees of conditions which might lead to an SSO prompting dispatch of any number of on-call employees to the site.

O.5.2 COASTAL EROSION

Several of M1W's assets are located near the coastline, thus making them susceptible to coastal storms and erosion. Specifically, assets vulnerable to coastal erosion include:

- Station 15- Coral Street, Pacific Grove
- Station 7- Reeside, Monterey
- Station 13- Fountain Avenue, Pacific Grove
- Monterey Pump Station- Del Monte Boulevard, Monterey
- Seaside Pump Station- Bay Street, Seaside
- Conveyance Pipelines- 13.28 miles (includes 2.1 miles of Ocean Outfall)

During March 2016 extreme wave action was observed. This coupled with the high rate of coastal erosion documented in Southern Monterey Bay, the highest in the State of California, resulted in M1W's Land/Ocean Outfall junction structure being exposed. The exposure required emergency protection work which included installation of sheet piling on both sides of the outfall pipe to prevent the sand from further eroding and undermining the pipeline. Emergency work was successful, and the site is closely monitored for changes. M1W is in the process of assessing the feasibility and appropriateness of various courses of action to ensure the long-term operability of the outfall. The technical memorandum recommendations have been included as mitigation measures in *Table O-10*.

Stations 15, 7, 13 and the Monterey and Seaside Pump Stations are all located directly adjacent to the Monterey Bay coastline near sea level. Mitigating potential SSO events, especially those in Pacific Grove adjacent to the Federally designated Area of Special Biological Significance (ASBS), is among the highest of M1W's priorities. M1W's preventative maintenance program, CIP, and SCADA system work together to identify vulnerabilities and mitigate them based on risk.

Conceptual projects addressing climate-related challenges at these locations, including but not limited to coastal erosion, are further described in **Section O.5.15, *Climate Change & Sea Level Rise***.

O.5.3 DAM AND LEVEE FAILURE

Dam Failure

The following M1W infrastructure is vulnerable in the event of an upstream dam failure:

- Regional Treatment Plant- Del Monte Boulevard, Marina
- SRDF- Salinas River, Marina*
- SVRP- Del Monte Boulevard, Marina*
- Moss Landing Pump Station- Moss Landing Road, Moss Landing
- Marina Pump Station- Reservation Road, Marina
- Fort Ord Pump Station- Marina Drive, Marina
- Salinas Pump Station- Hitchcock Road, Salinas
- Farmworker Housing Pump Station #1 – Hitchcock Road, Salinas
- Pond 3 Pump Station – South Davis Road, Salinas *
- Castroville Pump Station- Highway 1 North, Castroville
- Conveyance Pipelines - 18.37 miles

Releases from both the Nacimiento and San Antonio reservoirs flow northward towards the Monterey Bay through the channel of the Salinas River, adjacent to the location of the structures listed above. Combined, both reservoirs have a storage capacity of approximately 712,900 acre-feet. Should one or both reservoirs fail, water released could place the aforementioned structures at risk of inundation or

other structural damage. New structures located in areas susceptible to flooding are built using the most current techniques guided by California Building Code to ensure operability through inundation events, while existing structures are retrofitted to withstand events to the highest extent possible.

Levee Failure

Levee failure does not currently pose a major risk to the Agency's infrastructure or facilities.

O.5.4 DROUGHT AND WATER SHORTAGE

Monterey County is isolated from state and federal water supplies and must rely solely on its local water resources, groundwater, and surface water from watersheds with negligible influence from snowpack. As extreme heat and extended drought become more frequent, the region must ensure access to sustainable water supplies. To that end, in addition to providing wastewater treatment services to the community, M1W recycles its wastewater to diversify local water supplies for the agricultural and urban sectors.

Both water recycling projects, the SVRP, and PWM/GWR Project, provide sustainable supplemental water sources to traditional supplies. However, both projects rely upon availability of source water and therefore could be affected adversely in the event of drought.

Drought and water shortage could affect the Agency's operations in the following ways:

Conservation resulting in:

- Reductions in influent, resulting in less source water availability to meet recycled water obligations.
- Changing wastewater characteristics, possibly due to longer in-pipe retention times and higher concentrations (see **Section O.5.1, Agricultural Emergency**).
- Collection's system backups and possible SSOs due to lack of water flow to carry solids.

Reduced precipitation:

- Impacting reservoir storage and therefore limiting or precluding operation of the SRDF for agricultural use.
- Limiting seasonal surface water flows resulting in the inability to utilize the Blanco Drain and Reclamation Ditch surface water rights.
- Limiting the amount of stormwater diverted and stored in the Salinas Industrial Wastewater Treatment Facility (IWTF) ponds for later conveyance to the RTP for recycling.

O.5.5 EARTHQUAKE

A 1998 report by Dames and Moore detailed local geology, seismic setting, and historic seismicity of M1W facilities including pump station buildings, equipment, piping, and tanks. The study determined that there was a very low life-safety risk due to earthquake; however, that there could be economic and environmental impacts if an earthquake were to occur.

Per that report, the following infrastructure would be vulnerable to earthquake-induced liquefaction of the following calibers:

Moderate:

- Monterey Pump Station- Del Monte Boulevard, Monterey
- Seaside Pump Station- Bay Avenue, Seaside
- Fort Ord Pump Station- Marina Drive, Marina
- Marina Pump Station- Reservation Road, Marina
- Conveyance Pipelines- 15.47 miles

Moderate-to-High:

- Salinas Pump Station- Hitchcock Road, Salinas
- Moss Landing Pump Station- Moss Landing Road, Moss Landing
- Castroville Pump Station- Highway 1 North, Castroville
- Conveyance Pipelines- 9.62 miles

Another study prepared for M1W in 1991 concluded that seismic events are more likely to impact large stations than small stations because of the potential for a high-volume spill. High flows also preclude pump-arounds because flow rates exceed the capacity of portable pumps. Conversely, small pump stations like the Moss Landing Pump Station are likely to have a lower flow rates and a smaller mass of equipment.

More recently, seismic studies of the RTP have identified specific project needs for existing facilities within the plant and an effort has been made to complete those projects through the CIP. Seismic assessments are also conducted every 5 years for the chlorine system as required by the system's Risk Management Plan.

O.5.6 FLOODING

In any one year, the probability of the occurrence of a 100- or 500-year flood affecting M1W facilities is low. However, there is a high probability that localized flooding will occur in areas that could affect pump stations. A 1991 C2MHill report explored the risk of damage to M1W facilities due to flooding.

According to that document and the most current floodplain maps, the following facilities are located in areas at risk of flooding:

- Salinas Pump Station- Hitchcock Road, Salinas
- SRDF- Salinas River, Marina*
- Pond 3 Pump Station- Hitchcock Road, Salinas
- Farmworker Housing Pump Station #1- Hitchcock Road, Salinas
- Pond 3 Pump Station – South Davis Road, Salinas
- Castroville Pump Station- Highway 1 North, Castroville
- Moss Landing Pump Station- Moss Landing Road, Moss Landing
- Station 15- Coral Street, Pacific Grove
- Conveyance Pipelines - 19.9 miles

Both the Salinas and Castroville Pump Stations are designed to prevent inundation in the event of a 100-year flood event. They have both been equipped with flood protection enhancements to manage flood levels three feet above the surrounding terrain in order to increase resiliency during a major

storm event. This project has resulted in a 500-year flood safety factor. Additionally, emergency generators, portable pumps, and on-call staff are prepared for deployment to flood-prone areas during large storm events, while SCADA systems continuously report real-time data and information on station status allowing quick detection and response dispatch.

Localized flooding not correlated to floodplain, such as coastal flooding, storm surge, and wave run-up is also a concern for M1W. Particularly Station 15 (located on Coral Street in the City of Pacific Grove) has previously been inundated by wave run-up during storms from the adjacent Monterey Bay. Due to its low-lying position on the coast, it is possible the station with could be flooded with seawater; however, on average, the set of circumstances that must precipitate to enable such inundation occurs only about every 3-5 years.

As part of M1W's wintertime readiness planning, sandbags and other protective equipment are stockpiled and made readily available to sites like Station 15, if necessary. Additionally, during storm events on-call staffing is increased to provide maximum resources for efficient incident response.

O.5.7 HAZARDOUS MATERIALS INCIDENT

Hazardous materials utilized for the wastewater treatment and water recycling processes are managed in compliance with regulatory requirements and safety standards in order to avoid any accidental release. M1W maintains an up-to-date Hazardous Materials Business Plan (HMBP), including hazardous materials inventory and site plans in the Certified Environmental Reporting System (CERS). This information is readily available to first responders as well as the Monterey County Hazardous Materials Management Service (HMMS), which serves as the Certified Unified Program Agency (CUPA) for Monterey County. In addition, staff is routinely trained on the safe hazardous materials handling procedures and has ready access to Safety Data Sheets with important chemical safety information for all chemicals stored onsite.

Each M1W-owned pump station has a site-specific Emergency Response and Contingency Plan, and for those M1W facilities meeting the federal Spill Prevention, Control, and Countermeasure Rule and the state Aboveground Petroleum Storage Act thresholds, M1W maintains Spill Prevention, Control, and Countermeasure Plans which are designed to eliminate or minimize the potential environmental risk of oil spills.

Additionally, per Clean Air Act Section 112(r) and California's Accidental Release Program (CalARP) requirements, M1W maintains a Risk Management Plan for the chlorine system located at the RTP. The Risk Management Plan is designed to prevent accidental releases of regulated substances, minimize the damage if releases do occur, and satisfy community right-to-know laws by performing a detailed engineering analysis of potential accident factors and the mitigation measures to reduce accident potential. The Risk Management Plan contains safety information, hazard review, operating procedures, training and maintenance requirements, compliance audits, and incident investigation procedures.

The following M1W infrastructure is located within the 3-mile buffer zone around hazardous materials facilities and major transportation routes throughout Monterey County, including:

- Regional Treatment Plant- Del Monte Boulevard, Marina (Fixed Site Facility)
- Salinas Pump Station- Hitchcock Road, Salinas (Fixed Site Facility)

- Pond 3 Pump Station- South Davis Road, Salinas
- Farmworker Housing Pump Station #1- Hitchcock Road, Salinas
- Fort Ord Pump Station- Marina Drive, Marina (Fixed Site Facility)
- Moss Landing Pump Station- Moss Landing Road, Moss Landing (Fixed Site Facility)
- Castroville Pump Station- Highway 1 North, Castroville (Fixed Site Facility)
- Monterey Pump Station- Del Monte Boulevard, Monterey (Fixed Site Facility)
- Seaside Pump Station- Bay Avenue, Seaside (Fixed Site Facility)
- Station 7- Reeside, Monterey (Fixed Site Facility)
- Station 13- Fountain Avenue, Pacific Grove (Fixed Site Facility)
- Station 15- Coral Street, Pacific Grove (Fixed Site Facility)
- Marina Pump Station- Reservation Road, Marina (Fixed Site Facility)
- Conveyance Pipelines - 29.55 miles

The following M1W infrastructure is located within the 1-mile buffer zone:

- Regional Treatment Plant- Del Monte Boulevard, Marina (Fixed Site Facility)
- Salinas Pump Station- Hitchcock Road, Salinas (Fixed Site Facility)
- Pond 3 Pump Station- Hitchcock Road, Salinas (Fixed Site Facility)
- Farmworker Housing Pump Station #1- Davis Road, Salinas (Fixed site Facility)
- Moss Landing Pump Station- Moss Landing Road, Moss Landing (Fixed Site Facility)
- Conveyance Pipelines- 9.81 miles

O.5.8 HUMAN CAUSED HAZARDS

M1W is heavily reliant on information technology (IT) and computerized process automation for the operation of the collection system, pump stations, and the wastewater treatment and water recycling facilities. A cyber-attack could hamper the function of the critical services that M1W provides, leading to sewer backups and discharge of untreated sewage.

As critical infrastructure with a high replacement cost, M1W's facilities could be a target for terrorism. A terrorist attack could seriously jeopardize the continuous operations of sewer collections, treatment, and recycled water production. M1W's infrastructure is unlikely to experience any impacts associated with mass migration and targeted violence.

O.5.9 PUBLIC HEALTH HAZARDS

Wastewater collection, conveyance, treatment, and recycling services provided by M1W are critical through all public health crises. To maintain safe and compliant operations, the RTP is manned 24 hours a day, 365 days a year. Without adequate staff available, the system may begin to experience failures that could result in SSOs and other adverse impacts to public health. However, as demonstrated during the recent COVID-19 pandemic, M1W is capable of adapting to and maintaining consistent levels of service throughout modified operations resulting from public health crises.

M1W developed the COVID-19 Exposure Control and Disease Preparedness Response Plan Meeting State and Federal regulatory requirements. The plan reduces the impact of COVID-19 on M1W, its workers, and the public, by addressing exposure risks, sources of exposure, routes of transmission, and other unique COVID-19 characteristics to allow workers to safely perform jobs required to maintain

continuity of operations. The plan implements engineering, administrative, work practice controls, and personal protective equipment (PPE) to meet the provisions in Title 8, CCR §3205.

O.5.10 SEVERE WEATHER

All severe weather hazards profiled in this Plan have the potential to impact M1W's facilities and infrastructure.

O.5.11 SLOPE FAILURE

Slope failure could affect some locations in the M1W collection system due to hilly and steep topography. Each M1W facility has undergone geotechnical survey to document site characteristics and identify risks of slope failure, erosion, and stability.

O.5.12 TSUNAMI

According to the most recent Tsunami Hazard Maps, the following coastally located M1W facilities and infrastructure are located within the tsunami hazard zone:

- Station 15- Coral Street, Pacific Grove
- Station 7- Reeside, Monterey
- Station 13- Fountain Avenue, Pacific Grove
- Monterey Pump Station- Del Monte Boulevard, Monterey
- Seaside Pump Station- Bay Street, Seaside
- Moss Landing Pump Station- Moss Landing Road, Moss Landing
- Castroville Pump Station- Highway 1 North, Castroville
- Pipeline- 21.33 miles (includes 2.1 miles of Ocean Outfall)

Aside from the life-safety risk to residents and visitors to Monterey County, M1W's greatest concern is preventing pump stations and coastally located infrastructure from becoming inundated by a heavy storm or tsunami event. To mitigate these risks to the highest degree feasible, M1W has implemented site-specific Emergency Response Plans (ERPs) and continues to make upgrades to coastal infrastructure to enhance resilience to inundation events.

O.5.13 UTILITY INTERRUPTION

M1W's treatment and conveyance system is reliant on electricity to function. M1W's facilities are all equipped with backup generator power that automatically transfers in the event of utility power outage. Each site is also equipped with above ground or underground stores of diesel fuel to provide a minimum of 21.9 hours of generator power during power outages. In addition, M1W maintains a fleet of portable, diesel-fueled emergency response equipment including generators and pumps.

Table O-2 summarizes the M1W Stationary Generators and Portable Fleet.

Table O-2
M1W Stationary Generators and Portable Fleet

Stationary Generators					
Location	Rating (KW)	Fuel Tank Capacity (gal)	Fuel Consumption Rate @ 100% Load (gal/hr)	Runtime at 100% Load (Hours)	Runtime on Typical Station Load (50%) (Hours)
Moss Landing	102	550	8.2	60.4	105.3
Castroville	350	1,000	28.6	31.5	51.4
Salinas ¹	2000	6,000	137	39.4 ²	76.0 ²
Marina	350	2,000	24.4	73.7	134.0
Fort Ord ¹	1200	6,000	102	52.9 ²	83.0 ²
Seaside ¹	1160	6,000	102	52.9 ²	83.0 ²
Monterey	1000	6,000	69.3	77.9	153.0
Station 7	135	250	10	22.5	45.9
Station 13	350	520	21.4	21.9	41.0
Station 15	217	428	15.2	25.3	50.7
Farmworker Housing	28	180	2.2	73.6	125.6
RTP – Main	1,500	1,100	103.6	9.5	12.4 ³
RTP – Chlorine System	300	100	23	3.9	7.1
RTP – Headworks	40	110	3.4	29.1	55
Portable Fleet					
Description			Rating (KW)	Fuel Consumption Rate @ 100% Load (gal/hr)	
750 kW Portable Emergency Generator Set (1440)			750	54.5	
150 kW Portable Emergency Generator Set (1471)			150	11	
70 kW Portable Emergency Generator Set (1485)			70	4.4	
56 kW Portable Emergency Generator (1521)			56	4.4	
10-inch Portable Emergency Pump Set (1410)			--	19.7	
6-inch High Pressure Portable Pump Set (1429)			--	11.7	
6-inch Low Pressure Portable Pump- FM (1509)			--	3.7	
6-inch Low Pressure Portable Sewage Pump (1503)			--	4.52	
10-inch Portable Emergency Pump Set (1410)			--	19.7	
6-inch High Pressure Portable Pump Set (1429)			--	11.7	
6-inch Low Pressure Portable Pump (1509)			--	3.7	
6-inch Low Pressure Portable Sewage Pump (1533)			--	4.2	
¹ Two identical generators at station					
² Runtime with one generator online					
³ 70-80% load (80 gal/hr)					

M1W operates an onsite cogeneration facility at the RTP consisting of three, 580 KW, dual-fueled engines (natural gas/onsite-generated biogas) which are capable of generating enough power for the primary and secondary treatment processes to meet ocean discharge standards. Coupled with stationary backup generator power, M1W is equipped to maintain continuous wastewater treatment

in the event of an extended utility power outage. Due to severe winter storms interrupting utility power in February 2017, M1W did just that for 5 days with the only challenge being diesel fuel supply for the auxiliary stationary backup generators.

M1W and the Monterey Regional Waste Management District (MRWMD) have begun exploring co-energy management opportunities (e.g., developing a microgrid) to serve the dual purposes of assisting MRWMD in meeting state-mandated organics diversion targets (SB 1383, Short Lived Climate Pollutants), as well as further insulating M1W operations from utility power outage. M1W will continue to identify improvements that could be implemented to further fortify its operations for increased resiliency in the event of utility power outages.

O.5.14 WILDFIRE

Wildfire does not pose a major threat to M1W's facilities but remains a possible risk. California continues to experience an increase in wildfire hazards due to climate change and this could lead wildfire risk to become higher in the near term.

O.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

In 2021, M1W initiated the process of developing a Climate Action and Adaptation Plan (CAAP). Part of the effort will include a climate vulnerability assessment and greenhouse gas (GHG) inventory that will provide a baseline for the plan. The plan will serve as a comprehensive policy and strategy document for addressing the impacts of climate change on M1W's infrastructure by identifying targeted policies, programs, and projects that will both mitigate M1W's contribution to GHG emissions and increase its adaptive capacity.

The Climate Action and Adaptation Plan will:

- Build upon existing M1W climate adaptation and mitigation efforts
- Identify long-term management and adaptation projects to increase the reliability of the WCS and reduce economic and environmental risks
- Prioritize GHG reduction activities using a thorough analysis of existing energy use, opportunities and constraints, and thorough exploration of conservation and renewable energy technologies for the water industry

M1W is already a regional leader in the conservation of electricity and the reduction of GHG emissions exemplified by its use of solar energy to produce recycled water and utilization of biogas from decomposition of organic matter to power wastewater treatment processes. As climate change adaptation and mitigation requirements increase in California to meet state goals, M1W is poised to further reduce its carbon footprint, and is seeking additional sources of renewable energy to further reduce its reliance on fossil fuels to power facilities and reduce GHG emissions.

Spurred on by recent legislation requiring significant diversions of organics from landfills (SB 1383, Short Lived Climate Pollutants), M1W and neighboring MRWMD have renewed planning efforts for co-management of organics for cogeneration and potential microgrid development. Benefits include increased local resiliency to PG&E power supply reliability challenges and power utility cost savings.

In addition, Monterey County is isolated from State and Federal water supplies and must rely solely on its local water resources – historically, groundwater and surface water from watersheds with negligible influence from snowpack. As extreme heat and extended drought become more frequent due to climate change, the region must also ensure access to sustainable water supplies. M1W supports climate resiliency of its service area by recycling wastewater to diversify local water supply for the agricultural, urban, and hospitality/tourism sectors.

As discussed in *Section O.5.2* (Coastal Erosion), *O.5.6* (Flooding), and *O.5.12* (Tsunami), a significant portion of M1W’s infrastructure is located in the coastal zone in the region of the Monterey Bay coastline with the highest rates of coastal erosion in the State of California. M1W is required to comply with the California Coastal Act for its facilities in the designated Coastal Zone. Coastal Act compliance, along with the intense scrutiny of regional marine protection and research entities, will require M1W to fully explore and, if feasible, implement projects using a full suite of possible climate change adaptation measures, including managed retreat of infrastructure rather than simply armoring facilities.

Based on sea level rise projections, the following coastally located M1W infrastructure is within the sea level rise hazard zone for Monterey County:

- Station 15- Coral Street, Pacific Grove
- Station 7- Reeside, Monterey
- Station 13- Fountain Avenue, Pacific Grove
- Monterey Pump Station- Del Monte Boulevard, Monterey
- Seaside Pump Station- Bay Street, Seaside
- Moss Landing Pump Station- Moss Landing Road, Moss Landing
- Castroville Pump Station- Highway 1 North, Castroville
- Pipeline- 21.33 miles (includes 2.1 miles of Ocean Outfall)

Projects have been identified and conceptually described in the context of M1W’s active participation in short and long-range planning processes (e.g., Integrated Regional Water Management Plans, City of Pacific Grove Shoreline Management Plan, etc.) and the pursuit of grant funding opportunities. Examples of these conceptual projects which aim to enhance M1W’s climate resiliency include:

Coral Street Pump Station Climate Resiliency Project

Coral Street Pump Station is a subsurface wastewater pump station located on the ocean side of Ocean View Boulevard. As a result of its location, the station is subject to the effects of climate change including sea level rise, coastal erosion, and storm surges that can result in inundation of the wet well, and thus, electrical reliability challenges. The Coral Street Pump Station Climate Resiliency Project would involve engineering design, environmental review, permitting, and construction to waterproof the facilities by relocating key electrical components to a new location at nearby Esplanade Park.

Seaside Pump Station Climate Change and Erosion Adaptation Study

Seaside Pump Station is situated within coastal dune habitat approximately 26 feet above mean sea level (MSL), 200 feet inland from the ocean on a property with a shallow grade sloping northwest towards the Monterey Bay. As is the case with Coral Street Pump Station, its location makes Seaside Pump Station increasingly vulnerable to climate-change impacts including coastal erosion and sea level

rise. Separately, the station suffers operational challenges and excess energy use related to available pump capacity versus actual flow resulting in costly and labor-intensive maintenance, repair, and replacement caused by vibration and cavitation.

These operational challenges have been exacerbated by California's prolonged droughts, the most recent of which caused Monterey Peninsula water users to achieve significant indoor water conservation and thus lower wastewater flows. The Seaside Pump Station Climate Change and Erosion Adaptation Study would include conducting a feasibility and alternatives analysis for solutions for protecting the M1W collection system in this area.

Options that could be evaluated include:

- **Sand Replenishment/Beach Nourishment:** Southern Monterey Bay has the highest rate of coastal erosion in the State. Various coastal communities, including nearby City of Monterey considered sand nourishment as a tactic for protecting coastally located assets from the effects of beach erosion. Although the site may be an ideal location for this application, the potential positive beach accretion resulting from the agreement reached between the Coastal Commission and CEMEX to sunset sand mining activities at their Marina location should be considered. This mine has been implicated as one of the major factors in the high rate of coastal erosion in southern Monterey Bay. Should it be determined that the station should remain in its current location, M1W would initiate design and engineering to upgrade and/or reconfigure the station to optimize the reception and conveyance of current and future potential wastewater and stormwater flows.
- **Inland Station Retreat/Land Swap Agreement:** During construction of Seaside Pump Station, California State Parks and M1W entered into an agreement for future land swap. Dated March 1991, that agreement states that in the event that M1W and State Parks agree that coastal erosion necessitates the relocation of the existing station, pipelines, and appurtenant facilities, State Parks will exchange the existing station site for one approximately equal in size within the confines of the parcel. State Parks would restore the site to native coastal dune habitat and enhance public beach access.
- **Station Removal and Flow Reroute:** In addition to long-term climate change vulnerability, Seaside Pump Station has historically had challenges with station design and pump capacities relative to actual flows. For this reason, maintenance of existing pumps and reliability of operations have led staff to consider the feasibility of rerouting the wastewater flow to an alternate existing pump station to allow for the removal of Seaside Pump Station altogether. This project alternative would include in-depth hydraulic modelling and analysis.

The project will be designed to accommodate additional flows, including storm water from the City of Seaside's nearby 90-inch stormwater outfall and other urban dry weather and storm flows that may be diverted to M1W's infrastructure from the cities of Pacific Grove and Monterey. Any additional flows would then become influent to the RTP for beneficial reuse.

Ocean Outfall Beach Junction Structure Managed Retreat Project

M1W's land/ocean outfall pipeline was constructed and put into service in 1984 to convey secondary treated effluent from its Treatment Plant 2.1 miles out into the Monterey Bay. The land outfall consists of a 60-inch reinforced concrete pipe and transitions to the ocean outfall at the junction structure (a

drop manhole structure) located on the beach adjacent to the CEMEX sand mining operation. Due in part to the El Nino-driven wave action during the 2015/2016 winter season, a portion of the land outfall pipeline at the junction structure was exposed on the beach adjacent to the CEMEX sand mining operation in Marina. The aforementioned high rate of coastal erosion in the Southern Monterey Bay region is believed to have contributed to the pipeline exposure. M1W staff acted quickly to install emergency protection measures (sheet piling and filter fabric on both sides of the land outfall pipeline upstream of the junction structure) to minimize risk of a potential pipeline failure. These temporary protection measures are planned to remain in place until M1W implements a permanent solution, most likely involving a managed retreat strategy to relocate this critical junction structure further inland.

M1W has performed a feasibility and alternatives analysis of options for protecting the junction structure and outfall pipeline through the year 2100. However, considering current and potential future conditions and changes to site activities per the June 2017 CEMEX/Coastal Commission sunset agreement, not the least of which is how cessation of sand mining activities will affect beach accretion local to the outfall junction structure, M1W is still in process of determining optimal design, retreat method, and location for replacement facilities for this project.

O.6 CAPABILITY ASSESSMENT

M1W performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table O-2*
- An assessment of administrative and technical capabilities is presented in *Table O-3*
- An assessment of fiscal capabilities is presented in *Table O-4*
- An assessment of education and outreach capabilities is presented in *Table O-5*
- An overall self-assessment of capability is presented in Section O.6.1 in *Table O-6*

Table O-2

Planning and Regulatory Capability

Document, Program, Requirement	Department	Comments
General Management Plan	☒ • Maintenance	Sanitary Sewer System Management Plan
Capital Improvement Plan	☒ • Engineering	The Agency's CIP is the Master Plan for future Projects.
Stormwater Management Plan	☒ • Monterey SEA • Source Control	M1W is the administrative agent for Monterey Stormwater Education Alliance (SEA), a regional program to assist the County of Monterey and Cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside in meeting Clean Water Act requirements for urban runoff to protect and enhance environmental quality of watersheds and beaches. The Stormwater

Table O-2
Planning and Regulatory Capability

Document, Program, Requirement	Department	Comments
		Management Plan identifies the regulations each entity must implement and enforce locally to protect the water quality of waterways like the Monterey Bay National Marine Sanctuary. M1W Source Control staff also provides contract stormwater inspection services to several of its member entities.
Coastal Management Plan	☐	
Climate Action/ Adaptation Plan	☒ • Community Relations	Development of a M1W Climate Action Plan has been initiated and is anticipated to be completed by the end of 2021.
Emergency Operations Plan	☒ • Multiple	M1W is in the process of developing a Business Plan including continuity of operations in the event of emergency.
Specific Emergency Response Plans	☒ • Maintenance	M1W is in process of developing site-specific Emergency Response Plans (ERPs) that may be called upon in the event of an emergency resulting in a Sanitary Sewer Overflow (SSO). The ERPs include station-specific bypass pump around operations, traffic control plans, and other important information for first responders to manage and reduce impacts to public health and the environment caused by an SSO.
Continuity of Operations Plan	☒ • Administration	M1W is in the process of developing a Business Plan including continuity of operations in the event of emergency.
Evacuation Plan	☒ • Safety	See M1W Business Response Plan (RTP and Administration Offices), Chlorine Risk Management Plan, and Hazardous Materials Business Response Plans for the RTP and Pump Stations.
Illness and Injury Prevention Plan	☒ • Safety	M1W's safety program maintains an up-to-date Illness and Injury Prevention Plan (IIPP).
Business Response Plan	☒ • Multiple	M1W is in the process of developing a Business Plan including continuity of operations in the event of emergency.
Hazardous Materials Plan	☒ • Safety	M1W's Chlorine Risk Management Plan and Hazardous Materials Business Response Plans for the RTP and Pump Stations.

Table O-2
Planning and Regulatory Capability

Document, Program, Requirement	Department	Comments
Site Plan Review Requirements	☒ • Source Control	M1W Source Control reviews new development in each Member Jurisdiction for conformance to Member-Entity Programs and sewer system requirements

Table O-3
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒ • Engineering	M1W's Engineering Department includes an P.E. who also holds an American Institute of Certified Planners (AICP) certification.
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒ • Engineering	All of M1W's Engineers are licensed Civil Engineers in the State of California. The Engineering Department also employs a Construction Inspector on staff and supplements staff with consultant expertise when needed.
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒ • Engineering	M1W's Engineering Department includes one P.E. with a B.S. in Environmental Engineering and one employee with an M.S. in Environmental Engineering.
Building Inspector	☒ • Engineering	M1W's Engineering Department includes an Engineering Tech who provides construction inspection services.
Emergency Manager	☒ • Safety	M1W's Safety Officer is the Designated Emergency Manager; additionally, M1W has a trained Emergency Response Team (ERT) that can be deployed during any number of emergency-situations.
Resource development staff or grant writers	☒ • Engineering • Government Affairs	M1W has the in-house resources to regularly pursue grant funding, including a diverse team dedicated to researching and applying for local, state, and federal opportunities.
Public Information Officer	☒ • Community Relations	M1W's Director of External Affairs and Communication Services Manager jointly provide this function for the Agency
Scientist(s) familiar with the hazards of the community	☒ • Laboratory	M1W's Laboratory Department includes several professionals who understand the

Table O-3
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
			hazards of the community, specializing in water quality and water resource issues.
Staff with education or expertise to assess the community's vulnerability to hazards	☒	• Engineering	M1W has 4 registered Profession Engineers who are skilled in this area.
Personnel skilled in Geographic Information Systems (GIS)	☐	• Engineering	
Maintenance programs to reduce risk	☒	• Maintenance	M1W employs a Computerized Maintenance Management System to track asset lifecycle, in addition to Preventative and Reliability-Centered Maintenance Programs to ensure that assets are properly maintained in good working order to reduce likelihood of failure in the event of a natural disaster.
Warning systems/services	☒	• Safety • Maintenance	Examples include audible/visible alarms of various types, SCADA and radio telemetry communications for reporting conditions at remote M1W infrastructure locations, and radio communications systems.
Mutual Aid Agreements	☒	• Maintenance	M1W is a member of the CalWARN network, a mutual assistance organization for water and wastewater agencies.

Table O-4
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	• Finance	
Capital Improvements Project Funding	☒	• Engineering	
Special Purpose Taxes	☐		
Stormwater Utility Fees	☐		
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☒	• Finance	
Development Impact Fees	☒	• Finance	
General Obligation Bonds	☒	• Finance	
Special Tax and Revenue Bonds	☒	• Finance	

Table O-5
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, etc.	☐	
Ongoing public education or information program	☒ • Community Relations	
Natural disaster or safety related school programs	☐	
Public-private partnership initiatives addressing disaster-related issues	☐	
Other:		M1W is a public utility. Customers are billed bi-monthly for wastewater services. Customer notifications, billings, and communications are available to disseminate important information.

Political Capability

M1W's governing Board of Directors sets policies and guides staff in program development, but political capability is complicated due to the regional governance of M1W and the varied priorities and needs of each city or district. Fortunately, as a public and environmental health agency, the Board regularly identifies and supports regional efforts to protect and prepare the community for a sustainable future.

Examples include:

- [Pure Water Monterey Groundwater Replenishment Project](#) (Hazard Addressed: drought/ climate change)
- [IRWM Implementation Grant Award Salinas Storm Water Management](#): Increasing Capture, Improving Treatment, Reducing Energy Use (Hazard Addressed: drought/climate change/flood vulnerability)
- [M1W Compliance with State Directives](#) to increase the use of recycled water. M1W operations include two water recycling and reclamation projects, the Salinas Valley Reclamation Project and Pure Water Monterey, which uphold this mission and strongly support local agricultural and tourist economies by providing sustainable water supplies. (Hazard Addressed: drought/climate change, agricultural emergency)

O.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Monterey One Water is a Joint Powers Authority and is therefore not eligible for flood insurance under the National Flood Insurance Program (NFIP).

O.6.2 SELF-ASSESSMENT OF CAPABILITY

Table O-6
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	High
Administrative and Technical Capability	High
Fiscal Capability	Limited
Education and Outreach Capability	Moderate
Political Capability	Limited
Overall Capability	Moderate

O.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

O.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

In the performance period since adoption of the previous hazard mitigation plan, the Agency made progress on integrating hazard mitigation goals, objectives, and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **Capital Improvement Plan:** The capital improvement plan includes projects that can help mitigate potential hazards. The Agency will strive to ensure consistency between the hazard mitigation plan and the current and future capital improvement plan. The hazard mitigation

plan may identify new possible funding sources for capital improvement projects and may result in modifications to proposed projects based on results of the risk assessment.

- **Sanitary Sewer System Management Plan:** State regulatory requirement to ensure efforts are made to reduce risks to public health, property and the environment.
- **Monterey Stormwater Education Alliance (SEA):** M1W is the administrative agent for Monterey Stormwater Education Alliance (SEA), a regional program to assist the County of Monterey and Cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside in meeting Clean Water Act requirements for urban runoff to protect and enhance environmental quality of watersheds and beaches. The Stormwater Management Plan identifies the regulations each entity must implement and enforce locally to protect the water quality of waterways like the Monterey Bay National Marine Sanctuary. M1W Source Control staff also provides contract stormwater inspection services to several of its member entities.
- **Climate Action Plan:** Highlights potential programs that could be implemented to reduce greenhouse gas emissions and discusses possible impacts of climate change. The development of a M1W Climate Action Plan has been initiated and is anticipated to be completed shortly.
- **Business Response Plan/Emergency Action Plan:** M1W staff are Disaster Service Workers and are trained to safely operate and maintain the critical sewer infrastructure 24/7 and during emergencies.
- **Illness and Injury Prevention Plan (IIPP):** M1W's safety program maintains an up-to-date Illness and Injury Prevention Plan (IIPP). The General Manager has authority and responsibility for plan implementation. The program includes facility and safety plans for sanitary facilities.
- **Chlorine Risk Management Plan and Hazardous Materials Business Response Plans:** Reduce the risk of hazardous materials incidents.
- M1W Source Control reviews new development in each Member Jurisdiction for conformance to Member-Entity Programs and sewer system requirements

Opportunities for Future Integration

As this hazard mitigation plan is implemented, Monterey One Water will use information from the plan as the best available science and data on natural hazards. The capability assessment presented in this annex identifies codes, plans and programs that provide opportunities for integration. The area-wide and local action plans developed for this hazard mitigation plan include actions related to plan integration, and progress on these actions will be reported through the progress reporting process described in **Volume 1**. New opportunities for integration also will be identified as part of the annual progress report. The plans and programs listed in the Capability Assessment cover the majority of Agency operations where the hazard mitigation goals are addressed. However, the capability assessment identified the opportunity for future integration of recommendations of the hazard mitigation plan for all the plans and programs listed as they are updated periodically

O.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the Agency's Planning Committee identified key vulnerabilities and hazards of concern. The Hazard

Problem Statements were primarily derived from M1W’s Hazard Mitigation Planning Committee and informed by review of existing literature and best available data relating to the vulnerability of M1W’s assets. These Problem Statements were developed to assist in the identification and analysis of potential hazard mitigation actions for M1W and helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the Agency are identified below:

- Infrastructure is aging and requires capital investment to ensure safe, reliable wastewater and water recycling services.
- Water supply is largely dependent on resources that fluctuate with rainfall and are heavily influenced by drought conditions (i.e., surface water and groundwater).
- Infrastructure is coastally located and thus vulnerable to sea-level rise, tsunami, coastal erosion, and intense storm events.
- Conservation in M1W’s service area is reducing the amount of influent for recycling services and changing the characteristics of wastewater.
- The Ocean Outfall Beach Junction Structure is susceptible to coastal erosion and storm events.

O.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

M1W’s Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the Agency’s planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table O-8* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

All actions from the 2016 Plan were reviewed and updated by the Agency during the planning process. *Table O-7* includes the status of action previous plan completed or removed from the previous plan.

In order to improve the mitigation action plan for this Plan update and align with the countywide Mitigation Action Plan, the Agency added more specificity and detail to previous plan actions in addition to the new actions added to the Hazard Mitigation Action Plan Matrix.

Table O-7
Monterey One Water Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
33	Commission a structural analysis of the most critical pump stations.	Completed	Pump Station & Conveyance System Condition

Table O-7
Monterey One Water Completed Mitigation Actions from 2016 MJHMP

2016 Action #	Description	Status	Narrative Update
			Optimization Study completed.
38	Televise gravity interceptors to identify structural and joint problems and verify the condition of the protective linings.	Completed	Project completed.
42	Update long-range plans for replacement/ upgrade of key equipment and systems including future demand, expected life, and equipment performance, possibility of technical obsolescence, and availability of parts.	Completed	Pump Station & Conveyance System Condition Optimization Study completed.
43	Identify mitigation measures for impacts to the Land/Ocean Outfall junction structure due to coastal erosion and coastal storms.	Completed	Study completed; additional analysis may be conducted commensurate with CIP scheduled in 2024/25 - 2027/28 FY.
45	Implement new Computerized Maintenance Management Software	Completed/ Ongoing	Implementation complete. Continue to utilize CMMS for tracking asset O&M.

Table O-8
Monterey One Water Hazard Mitigation Plan Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing	All	All M1W Personnel to be familiar with the written Illness and Injury Prevention Plan.	High	Safety	Internal
2	Ongoing	All	All M1W personnel to be familiar with the Business Response Plan (BRP).	High	Safety	Internal
3	Ongoing	All	Emergency Response Team members to have adequate training to respond to emergency.	High	Safety	Internal
4	Ongoing	All	Ensure that evacuations are safe and efficient.	High	Safety/ Emergency Response Team	Internal
5	Ongoing	All	Ensure communications (two-way radios, interior and exterior paging system) are maintained and in good working order.	High	Utilities	Internal
6	Ongoing	All	Ensure that warning devices (alarm bells, horns) are in working order.	High	Utilities	Internal
7	Ongoing	All	Locations of primary/ alternate evacuation routes, emergency exits, primary/alternate staging areas are prominently posted throughout facilities in locations that are visible to employees and visitors.	High	Safety	Internal
8	Ongoing	Hazardous Materials Incidents	Provide training to employees in the handling, storage, and control of hazardous materials.	High	Safety	Internal
9	Ongoing	Hazardous Materials Incidents	Provide training to employees in the handling of chlorine (Cl ₂), use of breathing apparatus, and what to do in case of emergency.	High	Safety/ Operations	Internal
10	Ongoing	Hazardous Materials Incidents	All personnel who could be exposed to hazardous materials must be trained in proper use of PPE.	High	Safety	Internal

Table O-8
Monterey One Water Hazard Mitigation Plan Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
11	Ongoing	All	Identify hazards and assess risk for service area through maintenance of and participation in the MJHMP.	High	All	Internal
12	Ongoing	All	Determine increased risk from specific hazards due to location for those hazards profiled in <i>Table O-1</i> .	High	All	Internal
13	Ongoing	Earthquake	All new construction is completed using latest earthquake-resistant design techniques to limit damage caused by earthquakes.	High	Engineering	Internal/ CIP
14	Ongoing	Flooding	All new construction within the 100-year flood zone to be completed with design that will limit damage from floods.	High	Engineering	Internal/ CIP/ HMGP
15	Ongoing	Earthquake	Continue to repair and make structural improvements to pipelines to enable them to perform to their design capacity.	High	Field Maintenance	Internal/ CIP
16	Ongoing	All	Continue maintenance efforts to keep pipelines free of obstructions.	High	Field Maintenance	Internal
17	Ongoing	All	Develop and implement risk-based hazard mitigation strategy through participation in MJHMP updates.	High	All	Internal/ Grants
18	Ongoing	All	Enhance M1W's capability to conduct hazard risk assessments through the continued participation in the MJHMP.	High	All	Internal
19	Ongoing	All	Pursue available grant opportunities to obtain funding for mitigation activities.	High	Community Relations	Grants
20	Ongoing	Severe Weather, Coastal Erosion, Flooding	Identify mitigation measures for facilities susceptible to coastal storms and erosion.	High	Engineering	Internal
21	Ongoing	Earthquake	Identify mitigation measures for earthquake events.	High	Engineering	Internal
22	Ongoing	Earthquake	Conduct more detailed geological investigations of facilities to determine the risk of damage from expansive soils.	Moderate	Engineering	Internal

Table O-8
Monterey One Water Hazard Mitigation Plan Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
23	Ongoing	Earthquake	If evidence of expansive soils is found, identify mitigation measures for them.	Moderate	Engineering	Internal
24	Ongoing	Flooding	Identify mitigation measures for facilities susceptible to flood.	High	Engineering	Internal/ Grants
25	Ongoing	Tsunami	Identify mitigation measures for facilities susceptible to tsunami.	High	Engineering	Internal/ Grants
26	Ongoing	Tsunami	Work with Tsunami Incident Response Plan Group and OES, to identify mitigation for facilities susceptible to tsunami.	High	Safety	Internal
27	Ongoing	Drought	Continue to pursue drought protection projects for M1W's service area.	High	Administration/ Engineering	Internal/ Grants
28	Ongoing	All	Coordinate with member entities to increase level of public knowledge and awareness of hazards that routinely threaten the area and how they affect M1W facilities.	High	Community Relations	Internal
29	Ongoing	All, Utility Interruption	Coordinate with member entities to provide info to the public on coping with disrupted sewage lines and wastewater service.	High	Emergency Response Team/ Engineering/ Public Outreach	Internal
30	Ongoing	All	Ensure backup systems exist for critical facilities to the greatest extent possible.	High	Maintenance	Internal/ CIP
31	Ongoing	All	Plan for emergency response by stockpiling relevant materials.	High	Safety/ Emergency Response Team/ Operations/ Maintenance	Internal
32	Ongoing	All	Pre-position emergency power generation capacity (or have rental/lease agreements for generators) in critical locations for continuity services.	High	Maintenance/ Utilities	Internal

Table O-8
Monterey One Water Hazard Mitigation Plan Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
33	Ongoing/ As Needed	All	Commission new Geotech investigations for new facilities as applicable.	Moderate	Engineering	Internal/ CIP
34	Not yet scheduled	Earthquake	Conduct seismic vulnerability assessment of all pump stations to identify areas of possible liquefaction.	Moderate	Engineering	Internal/ CIP
35	FY 2022/23 - 2025/26	All	Assess condition of external corrosion on transport system and develop long-term program for maintenance of corrosion protection system.	High	Engineering	Internal/ CIP
36	FY 2022/23 - 2025/26	All	Explore measures to extend useful life of wastewater transport system force mains beyond 100 years by implementing corrosion protection measures.	High	Engineering	Internal/ CIP
37	FY 2022/23- 2027/28	All	Provide flexibility for the discharge force main at all pump stations.	Moderate	Engineering	Internal/ CIP
38	Ongoing	All	Review electrical control systems for major stations to determine if enough independent operations exist between each control system to ensure single system failure cannot disable the station.	High	Utilities	Internal/ CIP
39	FY 2022/23- 2027/28	All	Perform feasibility study to determine secondary containment is warranted, especially at stations where there are short detention times, environmental resources nearby, and where land is available.	Moderate	Engineering	Internal
40	FY 2024/25 - 2027/28	Severe Weather, Coastal Erosion, Flooding	Relocate the existing Land/Ocean Outfall Beach Junction Structure at least 650 ft. inland and install 650 ft. of new outfall pipeline at lower elevation to protect the Outfall from future erosion.	High	Engineering	CIP/Grant Funding
41	Ongoing	All	Continue to utilize Computerized Maintenance Management Software (CMMS) for tracking asset O&M.	High	Engineering/ Maintenance	CIP

Table O-8
Monterey One Water Hazard Mitigation Plan Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
42	New/ FY 2021/22	Climate Change	Develop Climate Action Plan (CAP) in order to outline strategies to reduce greenhouse gas emissions.	High	Community Relations	Internal
43	Ongoing	All	All M1W Personnel to be familiar with the Sewer System Management Plan (SSMP) and Sanitary Sewer Overflow Response Plan (SSORP) to ensure staff have adequate familiarity with emergency response and reporting measures for Sanitary Sewer Overflows (SSOs) within M1W's collection system to minimize the potential for SSOs and mitigate severity of impacts to the environment.	High	Maintenance	Internal
44	Ongoing	All	All Field O&M Staff to be trained on the SSMP and SSORP to ensure staff have adequate familiarity with emergency response and reporting measures for SSOs within M1W's collection system to minimize the potential for SSOs and mitigate severity of impacts to the environment.	High	Maintenance	Internal
45	Ongoing	All	Conduct bypass pump-around testing at M1W and member-entity pump stations to ensure staff are adequately trained in bypass pump-around mobilization, set up, and takedown in preparation for potential emergency response or maintenance activities requiring bypass pumping to minimize the potential for SSOs.	High	Maintenance	Internal

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ANNEX P: MONTEREY REGIONAL WASTE MANAGEMENT DISTRICT



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



P. MONTEREY REGIONAL WASTE MANAGEMENT DISTRICT

P.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

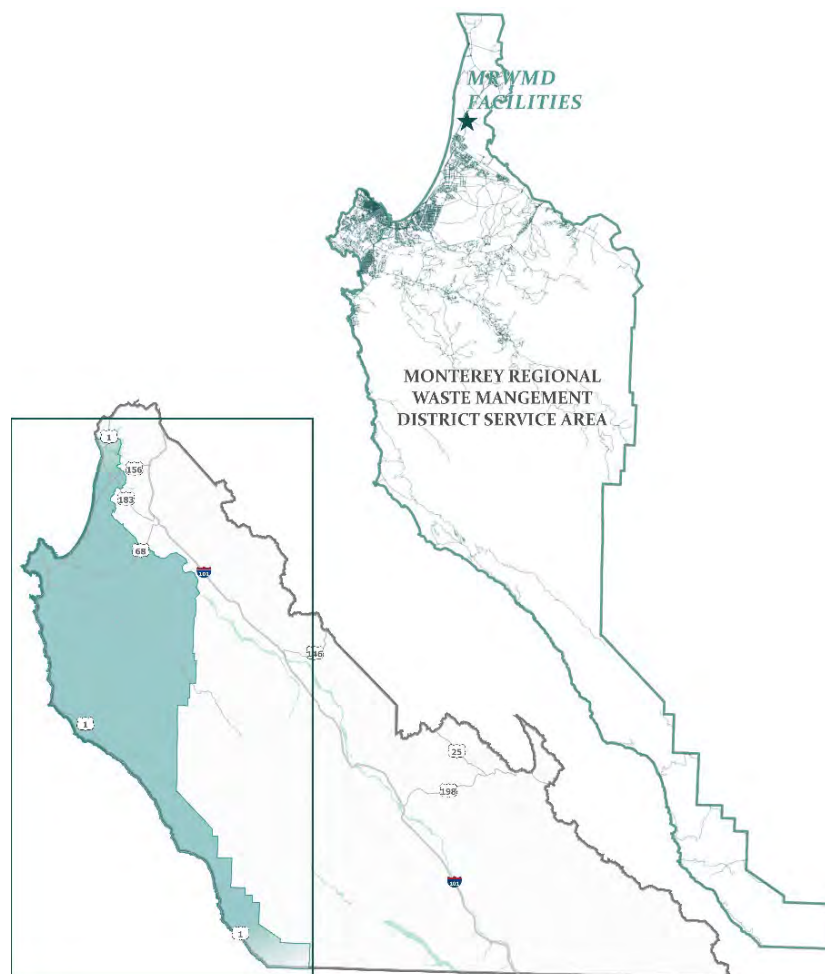
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P.2 DISTRICT PROFILE

P.2.1 LOCATION



P.2.2 SERVICE AREA

The Monterey Regional Waste Management District (MRWMD) covers a total of 853 square miles, including the cities of Carmel-by-the-Sea, Del Rey Oaks, Marina, Monterey, Pacific Grove, Sand City, Seaside, and the unincorporated areas of Big Sur, Carmel Highlands, Carmel Valley, Castroville, Corral De Tierra, Laguna Seca, Moss Landing, Pebble Beach, San Benancio, and Toro Park. The population currently served is approximately 170,000.

The District provides comprehensive, state-of-the-art waste management services. Their facility is located two miles northeast of Marina, in the Monterey Regional Environmental Park. In addition to a large landfill, their facilities include several important waste-reduction and waste diversion facilities that implement the District's stated vision of "Turning Waste into Resources." These include an indoor materials recovery facility to divert recyclable and reusable materials from the waste stream; systems that use landfill gas to generate electricity, and an innovative, anaerobic digestion food scrap composting project. The District also provides green waste processing and composting, household hazardous waste collection, reusable materials resale, and public outreach programs in support of its mission.

P.2.3 HISTORY

The Monterey Regional Waste Management District formed as the Monterey Peninsula Garbage and Refuse Disposal District in 1951. It formed after City leaders from Pacific Grove, Monterey, and Carmel united to petition the Monterey County Board of Supervisors to find a solution to the routine dumping and burning of waste on nearby coastal sand dunes. The District initially served a 75-square-mile area. In 1966, the First Board of the Monterey Peninsula Garbage and Refuse Disposal District purchased the property the District still occupies today. The large piece of land consists of 570 acres north of Marina and was the site for the new Monterey Peninsula Landfill.

The Monterey Peninsula Landfill opened in 1965 and over the years the District has added programs to reduce, reuse and recycle. From their early cardboard recycling in 1953, the first production of electricity from landfill gas in 1983, the establishment of the Last Chance Mercantile in 1991, to the Materials Recovery Facility that came on-line in 1996." The District changed its name to the Monterey Regional Waste Management District in 1987. Over the years, the District has won numerous awards including being recognized in 1998 as the Best Solid Waste System in North America and in 2016 the California Resource Recovery Association recognized the District with a Zero Waste Achievement Award.

P.2.4 GOVERNING BODY FORMAT

The District is an independent special district and governed by a nine-member Board of Directors. The Board consists of a representative from each of the seven cities within the District boundaries, plus one to represent unincorporated areas of the District, and a director-at-large. Board members are appointed to four-year terms. The Board maintains standing Finance and Personnel Committees, plus a Technical Advisory Committee that meets on an as-needed basis. The MRWMD Board meets monthly, and meetings are open to the public

P.3 PLANNING PROCESS

The Monterey Regional Waste Management District followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the District formulated their own internal planning team to support the broader planning process. The Monterey Regional Waste Management District held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, key problem statements, and mitigation strategies on September 23, 2021. Key stakeholders present at the meeting included:

- Guy Petraborg, Principal Engineer
- Tim Brownell, Director of Operations
- David Ramirez, Senior Engineer

P.4 FACILITIES

The District's facilities are located on its 475-acre property, 2 miles north of Marina, at the Monterey Regional Environmental Park, 14201 Del Monte Blvd. The property consists of a 315-acre permitted sanitary landfill site, a 126-acre buffer area (mostly Salinas River floodplain), 20 acres for the resource recovery facilities, a 12-acre Community Franchise Collection Facility, administrative offices, and maintenance buildings.

Monterey Peninsula Landfill

The 461-acre site began operating as a sanitary landfill two miles to the north of Marina in 1965. The District estimates the landfill to have a projected remaining lifespan of approximately 100-150 years of waste at current disposal rates. Currently, portions of the Landfill have been filled to an elevation of 130 feet, however the site is permitted to reach a final elevation of 264 feet. The entire Monterey Peninsula Landfill has been engineered with controls in place to separate waste safely from the environment. The landfill is composed of modules or cells that are filled in one at a time. The 23-acre module currently in use was completed in June 2013. The construction of a new module begins with an engineered composite liner made from a 2-foot-thick layer of clay, covered with a heavy plastic liner. Leachate collection pipes and sand are placed above the liner to catch any liquids draining from the waste – these are recirculated through the landfill. Finally, a 2-foot-thick layer of compost is placed over the sand drainage layer to protect the plastic liner from being damaged by heavy machinery.

Materials Recovery Facility (MRF)

The Materials Recovery Facility (MRF) is the centerpiece of the District's publicly owned infrastructure for recycling and reuse. Over the last 20 years, the District's first MRF diverted more than 1.6 million tons of recyclable and re-usable materials from landfill disposal. The new MRF 2.0 opened February 2018. The new facility dramatically expanded the District's capacity to divert materials from disposal. The MRF processes recyclables collected from the residential and commercial sectors of the Monterey Peninsula region, construction and demolition debris, and commercial mixed waste. The MRF also receives clean loads of source separated green and wood waste, mattresses, tires, and appliances. The MRF 2.0 supports local communities in compliance with State recycling requirements and helps achieve the 75% recycling goal by 2020. The construction and demolition material processing helps

ensure compliance with the CalGreen 65% diversion requirement for new construction and demolition projects.

“Landfill Gas to Energy” Facility

In 1983, the District developed and began operating one of the nation’s first landfill gas-to-electric energy plants at its facility. The process of capturing methane gas begins after organic waste deposited into the landfill is digested by anaerobic bacteria. The bacteria produce methane gas, which is recovered via a series of wells placed into the landfill. The wells are connected by a pipe system that creates a vacuum and induces the gas into a compression facility. After further refining, the gas is pumped into internal combustion engines, powering four engine/ generators to make electricity. Presently, the District’s four generators provide approximately 5 megawatts of clean alternative power, meeting all of the District’s own power needs and electrical power equivalent to the needs of 3,000 residences. The carbon savings realized from using this amount of landfill gas for power, rather than fossil fuel-generated power, is equivalent to removing emissions from an estimated 33,760 vehicles. The District sells excess power generated from this project to Pacific Gas and Electric (PG&E) and other power purchasers. Revenues from this project have generally exceeded expenses.

Anaerobic Digestion (Energy & Composting) Facility

The MRWMD dry anaerobic digestion (AD) pilot project, commissioned in 2013, was the first of its kind in the US. This pilot project was a public-private partnership between MRWMD and Zero Waste Energy that ended in fall 2019. The four shop fabricated steel digesters accepted 5,500 tons per year of a blend of 70% of food scraps and 30% of yard trimmings, mixed and loaded into an air-tight chamber where naturally occurring microorganisms are introduced via a liquid “percolate.” Over a 21-day process, these organisms broke down the biodegradable materials to produce methane gas with a minor amount of carbon dioxide. These biogases were then filtered and cleaned to power a combined heat and power engine that produces electricity. Waste heat was captured and reused to maintain a constant 130-degree percolate temperature. Energy from the project supplied 10% of the electricity need for the neighboring Monterey One Water facilities. The “digestate” that came out of the digesters then underwent a complete windrow composting process by Keith Day Company to complete the decomposition process. The success of the Organics to Energy compost program was attributable to the program participants: the commercial businesses that diligently separated food scraps, the haulers that collected it, and the public-private partnership with Zero Waste Energy, Keith Day Company, and the Districts’ neighboring public agency Monterey One Water, who received the electricity produced through anaerobic digestion.

P.5 DISTRICT SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the MRWMD’S hazards and assess the District’s vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the MRWMD is included in this Annex.

The MRWMD’s Planning Team used the same risk assessment process as the Monterey County Steering Committee. The District’s Planning Team used the Threat Hazard Risk Assessment (THIRA)

MONTEREY WASTE MANAGEMENT DISTRICT Multi-Jurisdictional Hazard Mitigation Plan

Survey to compare the impact of various hazards that could affect the District. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/ catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**.

Table P-1 displays the results of the hazard risk ranking exercise that was performed by the MRWMD's Planning Team.

Table P-1
Threat Hazard Identification Risk Assessment (THIRA): MRWMD

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	-	-	-	-	-	-
Coastal Erosion	-	-	-	-	-	-
Coastal Flooding	-	-	-	-	-	-
Cyber-Attack	1.0	2.0	2.0	2.0	7.0	Possible
Dam Failure	3.0	1.0	3.0	2.0	9.0	Moderate
Drought & Water Shortage	2.0	3.0	3.0	2.0	10.0	Moderate
Earthquake	3.0	3.0	2.0	2.0	10.0	Moderate
Epidemic	1.0	2.0	3.0	3.0	9.0	Moderate
Extreme Cold & Freeze	-	-	-	-	-	-
Extreme Heat	-	-	-	-	-	-
Flash Flood	3.0	2.0	3.0	3.0	11.0	Substantial
Hazardous Materials Incident	3.0	3.0	4.0	3.0	13.0	High
Invasive Species	-	-	-	-	-	-
Levee Failure	3.0	2.0	3.0	3.0	11.0	Substantial
Localized Stormwater Flooding	1.0	2.0	3.0	3.0	9.0	Moderate
Mass Migration	-	-	-	-	-	-
Pandemic	1.0	1.0	3.0	3.0	8.0	Possible
Riverine Flooding	3.0	2.0	3.0	3.0	11.0	Substantial
Sea Level Rise	-	-	-	-	-	-
Severe Winter Storms	-	-	-	-	-	-
Slope Failure	-	-	-	-	-	-
Targeted Violence	3.0	1.0	2.0	2.0	8.0	Possible
Terrorism	3.0	2.0	2.0	2.0	9.0	Moderate
Tsunami	-	-	-	-	-	-
Utility Interruption/ PSPS	3.0	2.0	2.0	3.0	10.0	Moderate
Water Contamination	3.0	2.0	2.0	2.0	9.0	Moderate
Wildfire	3.0	1.0	1.0	1.0	6.0	Slight
Windstorms	3.0	3.0	1.0	1.0	8.0	Possible

P.5.1 AGRICULTURAL EMERGENCIES

The MRWMD facilities are unlikely to experience any impacts associated with agricultural emergencies.

P.5.2 COASTAL EROSION

The District's facilities are not located on the coast, and therefore are not likely to be impacted by coastal erosion. The District could be impacted by other types of erosion not profiled in this Plan. The main impact of erosion impact to the District is flooding, so erosion impacts are discussed further in **Section P.5.6, Flooding**.

P.5.3 DAM AND LEVEE FAILURE

Dam Failure

Releases from both the Nacimiento and San Antonio reservoirs flow northward towards the Monterey Bay through the channel of the Salinas River, adjacent to the MRWMD facilities. A dam or spillway failure of the Nacimiento or San Antonio dam could expose the MRWMD's facilities to dam failure inundation risk.

Levee Failure

A levee along the Salinas River protects the Landfill from flood risk. A failure of this levee could have catastrophic impacts on the functioning of the landfill.

P.5.4 DROUGHT AND WATER SHORTAGE

Drought and water shortage is unlikely to have a major impact on the District's facilities or operations.

P.5.5 EARTHQUAKE

MRWMD facilities are designed to latest building codes to handle seismic events that are in effect at the time of construction. However, damage to multiple MRWMD facilities could still occur if a large enough earthquake were to occur. If an earthquake compromised the landfill, the impacts could be catastrophic. The District's facilities are also located in an area that is susceptible to liquefaction risk and this could be a major risk if an earthquake were to occur.

P.5.6 FLOODING

Portions of the District's landfill is located in the 100-year floodplain. This area is currently protected by a levee, but erosion on the north slope of the levee could cause levee failure, which could lead to flooding of the landfill. This risk is a serious concern to the District.

P.5.7 HAZARDOUS MATERIALS INCIDENT

Hazardous materials incidents could be a concern for the District. Since the District collects waste, hazardous materials could be incorrectly disposed of in the landfill. Hazardous materials can also spark fires caused by hot ashes or other items received in solid waste delivery loads, and other occasional eventualities.

P.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, the impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident.

MRWMD is heavily reliant on information technology (IT). A cyber-attack could hamper the functioning of the critical service particularly if it caused a power outage, which impacted the District's ability to provide services.

P.5.9 PUBLIC HEALTH HAZARDS

Based on the experience of the COVID-19 pandemic, it is noted that it is important to maintain continuous solid waste collection services through a pandemic or epidemic.

P.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to affect the district's facilities, though are unlikely to have a major impact. Severe winter storms have the potential to create flooding issues as described in **Section P.5.6, *Flooding***. Furthermore, severe storms in the area often involve high winds, which could make the District's operations more difficult. Furthermore, windstorms can cause prolonged and serious power outages, which could cause a catastrophic impact to the District's service.

P.5.11 SLOPE FAILURE

Based on the topography of the surrounding area, slope failure does not pose a serious threat to the District's facilities.

P.5.12 TSUNAMI

The District's facilities are not located in a mapped tsunami inundation zone.

P.5.13 UTILITY INTERRUPTION

Much of MRWMD'S facilities are reliant on electricity to function. Critical facilities must be maintained and operational. Environmental control systems, which need power to function, are required to remain operational. Fueling of garbage trucks could also be limited by a utility interruption. Utility interruption is a major concern for the District, however, there are improvements that could be implemented to further fortify and maintain function of critical systems with backup power sources, and to mitigate utility interruption.

P.5.14 WILDFIRE

Wildfire does not pose a major threat to the District's facilities but is a possible risk. hazards. California continues to experience an increase in wildfire hazards due to climate change and this could lead wildfire risk to become higher in the near term.

P.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will exacerbate the risk posed by many of the hazards previously profiled in this Plan and have a measurable impact on the occurrence and severity of natural hazards. Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure. Drought, coastal and inland flooding, and wildfire will likely affect people's livelihoods and the local economy.

P.6 CAPABILITY ASSESSMENT

The MRWMD performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table P-2*
- An assessment of administrative and technical capabilities is presented in *Table P-3*
- An assessment of fiscal capabilities is presented in *Table P-4*
- An assessment of education and outreach capabilities is presented in *Table P-5*
- An overall self-assessment of capability is presented in Section P.6.1 in *Table P-6*

Table P-2
Planning and Regulatory Capability

Document, Program, Requirement		Department	Comments
General Management Plan	☒		Joint Technical Document, Operational Plan
Capital Improvement Plan	☒		Investment Policy, Capital projects list in Joint Technical Document
Stormwater Management Plan	☐		
Coastal Management Plan	☐		N/A
Climate Action/ Adaptation Plan	☐		
Emergency Operations Plan	☒		Emergency Response Plan
Specific Emergency Response Plans	☒		Emergency Response Plan
Continuity of Operations Plan	☐		
Evacuation Plan	☒		Site Evacuation Plan, Muster Locations
Illness and Injury Prevention Plan	☒		
Business Response Plan	☐		
Hazardous Materials Plan	☒		
Other:	• Solid Waste Facility Permit		

Table P-3
Administrative and Technical Capability

Staff/Personnel Resources	Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒ • Engineering	
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒ • Engineering	
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒ • Engineering	
Emergency Manager	☒	Incident Commander designation hierarchy identified in Emergency Response Plan
Resource development staff or grant writers	☒ • All Departments	All departments can write grants as needed.
Public Information Officer	☒ • Communications • Public Education	
Scientist(s) familiar with the hazards of the community	☒ • Engineering	
Staff with education or expertise to assess the community's vulnerability to hazards	☒ • Engineering	
Personnel skilled in Geographic Information Systems (GIS)	☐	The District does not use GIS
Maintenance programs to reduce risk	☒	Equipment Maintenance Program
Warning systems/services	☒	Radio communication
Mutual Aid Agreements	☐	

Table P-4
Fiscal Capability

Fiscal Resources	Department	Comments
General Funds	☒ • Finance	
Capital Improvements Project Funding	☒ • Finance	
Special Purpose Taxes	☐	
Stormwater Utility Fees	☐	
Gas / Electric Utility Fees	☐	
Water / Sewer Fees	☐	
Development Impact Fees	☐	
General Obligation Bonds	☐	

Table P-4
Fiscal Capability

Fiscal Resources	Department	Comments
Special Tax and Revenue Bonds	☐	
Other:	• Disposal Fees at Landfill • Recycling Sales • Power Sales • Tenant rents/ lease agreements	

Table P-5
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, etc.	☒	Veterans Transition Services operate the Last Chance Mercantile
Ongoing public education or information program	☒	MRWMD offers an array of free workshops and events and communicates through the newspaper and social media. They also provide information on proper waste disposal and have an app called "What Goes Where."
Natural disaster or safety related school programs	☒	Tours are offered of MRMWD's Resource Facilities and Landfill to students. The District also has Waste Free School Support and donations program. The District can assist with student volunteer education and training for waste reduction, recycling, and compost projects.
Public-private partnership initiatives addressing disaster-related issues	☐	

Political Capability

The nine-member board of the MRWMD is supportive of hazard mitigation.

P.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The Monterey Regional Waste Management District is a Special District and is therefore not eligible for flood insurance under the National Flood Insurance Program (NFIP).

P.6.2 SELF-ASSESSMENT OF CAPABILITY

Table P-6
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Moderate
Fiscal Capability	Moderate
Education and Outreach Capability	Moderate
Political Capability	Moderate
Overall Capability	Moderate

P.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects
- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

P.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

MRWMD was not previously a part of the Monterey County Multi-Jurisdictional Hazard Mitigation Plan.

Opportunities for Future Integration

As this hazard mitigation plan is implemented, Monterey County Regional Waste Management District will use information from the plan as the best available science and data on natural hazards. The capability assessment presented in this annex identifies codes, plans and programs that provide

opportunities for integration. The area-wide and local action plans developed for this hazard mitigation plan include actions related to plan integration, and progress on these actions will be reported through the progress reporting process described in **Volume 1**. New opportunities for integration also will be identified as part of the annual progress report. The plans and programs listed in the Capability Assessment cover the majority of District operations where the hazard mitigation goals are addressed. However, the capability assessment identified the opportunity for future integration of recommendations of the hazard mitigation plan for all the plans and programs listed as they are updated periodically.

P.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the Districts' Planning Committee identified key vulnerabilities and hazards of concern. The Hazard Problem Statements were primarily derived from MRWMD's Hazard Mitigation Planning Committee and informed by review of existing literature about MRWMD's assets and analysis using best available data relating to the vulnerability analysis for each piece of critical infrastructure. They were developed to assist in the identification and analysis of potential hazard mitigation actions for MRWMD.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the District are identified below:

- Erosion of the north slope of the levee which protects the landfill, could cause the levee to failing causing a major flood hazard.
- Environmental Control Systems and critical services offered by the District require power to remain operational. A utility interruption could have large regulatory ramifications and cause catastrophic impact to services. Additionally, the District's facilities are located at the end of the transmission lines, which in the event of a major outage, could cause the power to be out for an extended period of time.
- Improperly disposed of hazardous waste is a major concern of the District and could have serious impacts on both operations and staff.
- A large earthquake, which affected the whole region could severely limit the District's ability to provide services. Additionally, if an earthquake compromised the landfill, the impacts could be catastrophic.

P.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The District's Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation

alternatives. Based upon the risk assessment results and the District’s planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table P-7* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

MRWMD was not previously a part of the Monterey County Multi-Jurisdictional Hazard Mitigation Plan.

Table P-7
MRWMD Hazard Mitigation Plan Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	In Progress	Flooding, Levee Failure	Complete needed levee upgrade to the levee which protects the landfill.	High	Engineering	HMGP Grants
2	New	All	Install backup generators to ensure the continued function of critical services.	High	Engineering	HMGP Grants, General Funds
3	Ongoing/ Continuous	All, Human-Caused	Consider opportunities for integrating more redundancy and/or isolation into IT infrastructure.	Moderate	Engineering	Grants, General Funds
4	New	Hazardous Materials Incident	Investigate the feasibility of a radiation detection system and response plan.	Low	Safety, Engineering	Grants, General Funds
5	Ongoing/ Continuous	All	Continue to maintain appropriate design of base liner/ cover liner system for the landfill.	High	Engineering, Maintenance	Grants, General Funds
6	New	Earthquake	Contingent on capital funding for seismic upgrades, complete a structural assessment of buildings.	Moderate	Engineering	Grants, General Funds
7	New	All, Utility Interruption	Investigate the use of a microgrid in order to mitigate the impacts to power supply. Consider a joint microgrid project with Monterey One Water who operates the Wastewater Treatment Plant adjacent to the District's facilities.	Moderate	Engineering	Grants, General Funds
8	Ongoing/ Continuous	All	Continue to make investments in resilient infrastructure in order to ensure the sustainability of public services.	High	Engineering	Grants, General Funds
9	Ongoing/ Continuous	Wildfire	Collaborate with jurisdictions with fire protection and suppression responsibility on response and recovery efforts.	Low	Operations	Grants, General Funds

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ANNEX Q: MOSS LANDING HARBOR DISTRICT



2021 Monterey County
Multi-Jurisdictional
Hazard Mitigation Plan



Q. MOSS LANDING HARBOR DISTRICT

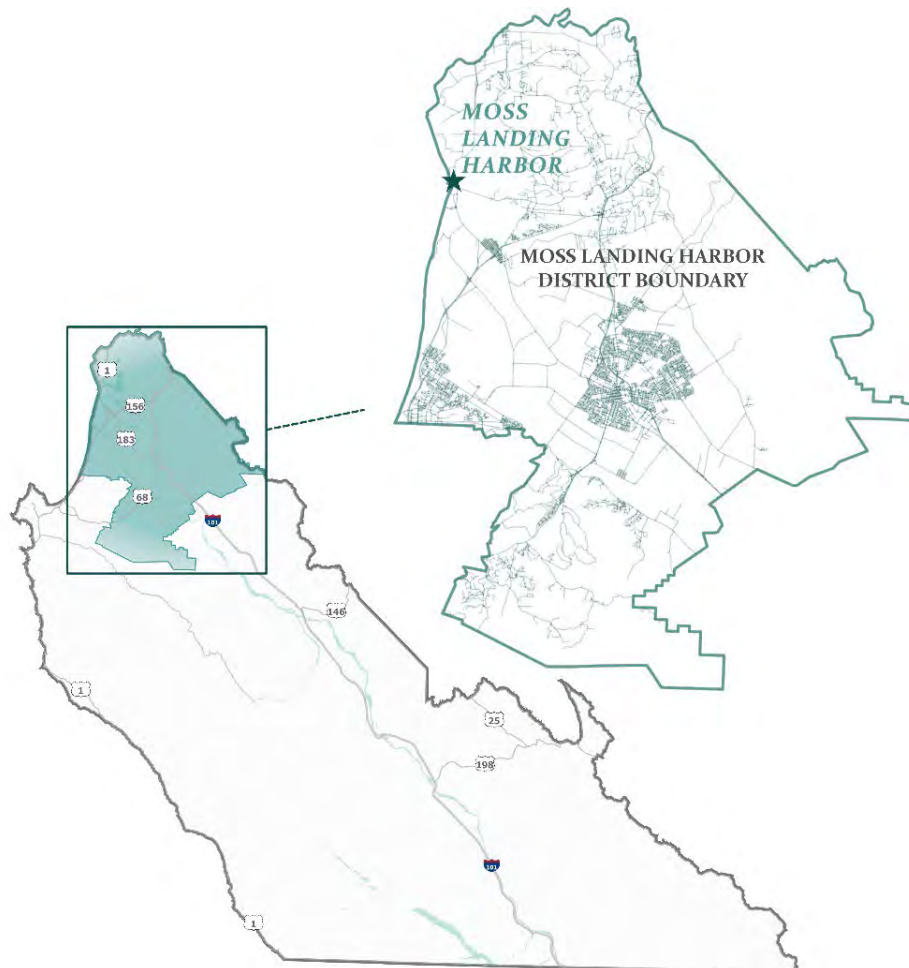
Q.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Tommy Razzeca
General Manager/Harbor Master
7881 Sandholdt Road
Moss Landing, CA 95039
(831) 633-5417
razzeca@mosslandingharbor.dst.ca.us

Q.2 DISTRICT PROFILE

Q.2.1 LOCATION



Q.2.2 SERVICE AREA

The Moss Landing Harbor is the number one commercial fishing harbor in the Monterey Bay with 600+ slips for recreational boaters and commercial vessels. Partnering with marine research and education institutions, the Moss Landing Harbor District provides full public access to the marine environment. Designated as a year-round port of safe refuge, Moss Landing Harbor provides safe, reliable marine refuge and services to members of the boating public. The District covers 364 square miles and extends from the bay east to the San Benito County line, and from the Santa Cruz County line as far south as the Corral de Tierra area.

Moss Landing Harbor supports the research and educational endeavors of the Monterey Bay Aquarium Research Institute and Moss Landing Marine Laboratories. More than 100 active fishing vessels can be berthed in Moss Landing at any time along with 7 research and government vessels. Two eco-tour pontoon boats are docked as well as charter fishing boats, whale watching vessels, kayak rentals and ecotourism businesses.

The Harbor supports commercial fishing and recreational boating as well as restaurants. The Jetty Road sand spit is located along the northeast side of the harbor. The Harbor provides parking and other harbor and beach access facilities which are located within both the north and south harbor areas (north and south of the main harbor entrance). Moss Landing Harbor properties are surrounded by the ocean, Elkhorn Slough, Moro Cojo Slough, and the nearby Salinas River. The proximity to the Monterey Bay National Marine Sanctuary and the ocean makes the Harbor a valuable maritime resource.

The Harbor District was designated a California Certified Clean Marina in 2007 and recertified in 2012. Marinas meeting the criteria for this certification are verified as providing environmentally clean facilities and protecting the state's coastal and inland waters from pollution through compliance with established best management practices.

Q.2.3 HISTORY

The land, submerged lands and tidelands comprising the Moss Landing Harbor were originally acquired by the State of California upon its admission to the US in 1850. In 1866, a wealthy Texan and retired ship captain named Charles Moss brought his family from Texas to the California shore where they built their new homestead. Realizing the potential of this location, Captain Moss, along with Portuguese whaler Cato Vierra, constructed a 200-foot wharf to establish shipping facilities and a pier for commercial water traffic. The locals thought enough of the captain to eventually call the place Moss Landing. Captain Moss later sold his holdings to the Pacific Coast Steamship Company.

The Moss Landing Harbor District was formed on June 22, 1943 for the purpose of developing a harbor at Moss Landing pursuant to the Federal Harbors and Navigation Code. The Harbor District Board executed an Easement and Franchise Agreement with landowner Wilbur C. Sandholdt granting the District easements and rights-of-way over approximately 13 acres of land through which the harbor channel would be cut.

In 1945, the United States Congress authorized construction of a harbor at Moss Landing by the United States Army Corps of Engineers. In 1947, dredging was completed, piers and wharves were built, and the harbor officially opened. The harbor's early activity level varied over the years with local agricultural production, railroad connections, and commercial fishing and whaling.

The State of California granted the Moss Landing Harbor District the Submerged and Tide lands of the Old Salinas River channel below the Potrero and Moss Landing tide gates and includes the main channel of Elkhorn and Bennet sloughs and the coastal tide lands to the north and south of the Moss Landing Harbor entrance.

Q.2.4 GOVERNING BODY FORMAT

The Moss Landing Harbor District (MLHD) is governed by the Board of Harbor Commissioners and they exercise the powers set forth in Sections 6070-6086 of the California Harbors and Navigation Code. The Board of Harbor Commissioners consists of five members, each of whom is a registered voter residing within the District. Members are elected by the registered voters of the District in a general election pursuant to California Elections Codes Section 32100 and are elected to four-year terms.

In addition to more typical special district legal rights and obligations, harbor districts—because they administer harbors, wharves, and channels—are authorized to pass ordinances and enforce regulations within their boundaries. The District’s personnel are authorized to enforce the California Harbors and Navigation Code. Violations of harbor-related ordinances are typically infractions.

Q.3 PLANNING PROCESS

The Moss Landing Harbor District followed the planning process explained in **Volume 1** of the plan. In addition to providing representation on the Monterey County Hazard Mitigation Planning Steering Committee, the District formulated their own internal planning team to support the broader planning process. The Moss Landing Harbor District held a Hazard Mitigation Plan Stakeholder meeting to discuss vulnerabilities, key problem statements, and mitigation strategies on September 28, 2021. Key stakeholders present at the meeting included:

- Tommy Razzeca, General Manager/Harbor Master
- Jeff Pritchard, Executive Assistant

Q.4 FACILITIES

A large amount of harbor related infrastructure was built within the footprint of the historical Old Salinas River. The Harbor entrance is maintained by two large rock jetties that reach more than 1,500 feet out from the main harbor channel into the open Monterey Bay. The jetties and channel are under the jurisdiction of the Army Corp of Engineers. The harbor mouth and main harbor channel are dredged periodically to maintain operational depth. Most of the 2.5 km of the south harbor waterfront is man-made and or hardened with riprap or concrete. Only one quarter (0.5km) of the north harbor waterfront is protected or hardened.

Moss Landing Harbor District jurisdiction extends to the Elkhorn Slough at the “mean high water mark.” The District-owned harbor property is approximately 85 acres, not including submerged lands. It berths over 600 boats, including 350 fishing boats, 200 pleasure craft, 12 research vessels, many transient vessels, and about six tour and charter boats. The District estimates that roughly half of these boats are owned by District residents. The District limits live-aboard boats to approximately 60. The harbor's commercial boats land Dungeness crab, halibut, king salmon, albacore, rockfish, squid, and a variety of other fish.

Facilities include the Main Harbor, located south of the main channel to the Monterey Bay, where larger vessels are berthed. The Main Harbor houses the Harbor Master's office, the Santa Cruz Cannery Building, parking, shower and laundry facilities for slip holders, and a small community park. Adjacent to this area, on District-owned land, is a recreational vehicle park that is open to the public, dry dock storage facilities, a maintenance dock, a maintenance shop building, and a bilge and oil pump-out facility that is available free of charge on a 24-hour basis. There are also new storage unit buildings, which are currently under ground lease. The Harbor has four boat launch ramps, five if the one in Kirby Park is included. The South Harbor includes the following docks: A Dock, B Dock, C Dock, G Dock, H Dock, I Dock, J Dock, E Dock, F Dock, K Dock

The North Harbor lies on the other side of the main channel and primarily serves recreational craft. The north side of the harbor includes a 900-foot public wharf, a 110-foot dock, paved parking, and a four-lane boat launch ramp. There is also a new 9,500 square foot waterfront building in the north harbor.

The District also owns and operates Kirby Park at the east end of Elkhorn Slough, about nine miles inland (via roads) from Moss Landing. This park provides parking and launch ramp for kayaks and other small vessels that can navigate the slough. A wheelchair-accessible nature viewing trail extends from the paved parking area. Other District-owned buildings at the harbor property include a 2,800-square-foot commercial building that is leased to a pottery shop and Monterey Bay Kayaks, a 33,600-square-foot cannery building leased to several marine-related and commercial fishing businesses, and a newly constructed seafood restaurant.

Q.5 DISTRICT SPECIFIC RISK ASSESSMENT

The intent of this section is to profile the Moss Landing Harbor District's hazards and assess the District's vulnerability distinct from that of the countywide planning area, which has already been assessed in **Volume 1** of the plan. The hazard profiles in **Volume 1** discuss overall impacts to the County and describes the hazards, as well as their extent, magnitude/severity, previous occurrences, and the likelihood of future occurrences. Hazard vulnerability specific to the Moss Landing Harbor District is included in this Annex.

The Moss Landing Harbor District's Planning Team used the same risk assessment process as the Monterey County Steering Committee. The District's Planning Team used the Threat Hazard Risk Assessment (THIRA) Survey to compare the impact of various hazards that could affect the District. Each variable was scored by hazard by the Planning Team on a scale from 1 to 4, or negligible/unlikely to extensive/highly likely/ catastrophic. The score for each variable was calculated using a weighted average of all survey responses. Scores were then added together to determine an overall hazard score between 1 and 16. Each score was associated with a qualitative degree of risk ranking from Negligible (between 1 and 4) to Very High (between 14.1 and 16). The Survey is described in more detail in *Risk Assessment Methods* in **Volume 1**.

Table Q-1 displays the results of the hazard risk ranking exercise that was performed by the Moss Landing Harbor District's Planning Team.

Table Q-1
Threat Hazard Identification Risk Assessment (THIRA): Moss Landing Harbor District

Hazard	Geographic Extent	Likelihood of Occurrence	Magnitude/Severity	Impact	Total Out of 16	Degree of Risk
Agricultural Emergencies	3.0	2.0	3.0	3.5	11.5	Substantial
Coastal Erosion	4.0	4.0	3.0	3.0	14.0	High
Coastal Flooding	4.0	2.0	3.0	3.0	12.0	Substantial
Cyber-Attack	2.0	2.0	2.0	2.0	8.0	Possible
Dam Failure	-	-	-	-	-	-
Drought & Water Shortage	-	-	-	-	-	-
Earthquake	3.0	3.0	3.0	3.0	12.0	Substantial
Epidemic	2.0	2.0	2.0	2.0	8.0	Possible
Extreme Cold & Freeze	-	-	-	-	-	-
Extreme Heat	-	-	-	-	-	-
Flash Flood	-	-	-	-	-	-
Hazardous Materials Incident	3.0	3.0	3.0	3.0	12.0	Substantial
Invasive Species	-	-	-	-	-	-
Levee Failure	-	-	-	-	-	-
Localized Stormwater Flooding	2.0	2.0	2.0	2.0	8.0	Possible
Mass Migration	-	-	-	-	-	-
Pandemic	2.0	2.0	2.0	2.0	8.0	Possible
Riverine Flooding	2.0	2.0	2.0	2.0	8.0	Possible
Sea Level Rise	4.0	3.0	4.0	4.0	15.0	Very High
Severe Winter Storms	4.0	4.0	4.0	4.0	16.0	Very High
Slope Failure	3.0	2.0	3.0	3.0	11.0	Substantial
Targeted Violence	-	-	-	-	-	-
Terrorism	-	-	-	-	-	-
Tsunami	3.0	3.0	3.0	3.5	12.5	High
Utility Interruption/ PSPS	2.0	2.0	3.0	3.0	10.0	Moderate
Water Contamination	-	-	-	-	-	-
Wildfire	-	-	-	-	-	-
Windstorms	2.5	2.5	2.5	2.5	10.0	Moderate

Q.5.1 AGRICULTURAL EMERGENCIES

Though the Harbor District's facilities are unlikely to experience any impacts associated with agricultural emergencies, an agricultural emergency caused by a chemical spill along the Salinas River could have serious impacts on the waterways. Contaminated sediment is very difficult to dispose so an agricultural emergency could have critical impacts on dredging operations.

Q.5.2 COASTAL EROSION

All Harbor facilities are at risk due to coastal erosion. Determination of assets at risk was based on analysis completed for the AB 691 Sea-Level Rise Assessment for Moss Landing Harbor (CCWG, June 2019). By 2030, coastal erosion of the sand spit that protects Moss Landing Harbor from ocean waves is predicted to be significant unless protective/adaptive actions are taken. Wave impacts along the beach are predicted to compromise dunes and coastal structures and reduce the long-term protection to the harbor.

By 2060, coastal erosion of the sand spit that protects Moss Landing Harbor from ocean waves is predicted to be significant and possibly jeopardize the harbor unless protective/adaptive actions are taken. Erosion of the dune barrier will likely lead to wave overtopping of the remaining dunes, allowing waves to enter the harbor, leading to vessel and dock damage and significant sedimentation. Failure of dunes are predicted along the entire stretch that parallels the harbor. Dunes adjacent to north harbor and dunes south of Sandholdt road have no structures or coastal armoring to reduce erosion, but also retain some natural dune building and migration capacity lost to development along Sandholdt Road. If dunes are allowed to migrate inland, these areas may retain their protective service. The impacts of sea level rise may also lead to significant erosion to Kirby Park launch ramp and parking area. By 2100, Winter storm waves and coastal erosion will likely bisect the sand spit above and below the Sandholdt Bridge, leading to limited use of the granted lands as a safe harbor marina.

Q.5.3 DAM AND LEVEE FAILURE

Dam Failure

Releases from both the Nacimiento and San Antonio reservoirs flow northward towards the Monterey Bay through the channel of the Salinas River, which outlets to the ocean near the Harbor. A dam or spillway failure of the Nacimiento or San Antonio dam could expose the Harbor's facilities to dam failure inundation risk, but this risk is likely to be minor.

Levee Failure

Multiple levees protect agricultural land along Elkhorn, Moro Cojo, and Bennett Sloughs. A failure of any of these levees is unlikely to have a significant impact on the Harbor, but it could change the flood management regime in the area, which could cause long-term residual impacts that could not be predicted at this time. Additionally, a levee failure could lead to increases in sedimentation in the Harbor that could affect dredging operations.

Q.5.4 DROUGHT AND WATER SHORTAGE

Drought is unlikely to have a major impact on the Harbor District's facilities or operations.

Q.5.5 EARTHQUAKE

Most of the Harbor's facilities are designed to the latest building codes to handle seismic events. However, damage to Harbor facilities could still occur if a large enough earthquake were to occur. Additionally, the Harbor District Office Building was built before a number of seismic codes were in place and is likely vulnerable to seismic risks. An earthquake would also likely impact bridges surrounding the Harbor which could make it impossible to access the Harbor.

The Harbor is also located in an area that is susceptible to liquefaction risk and this could be a major risk if an earthquake were to occur. In Moss Landing, following the Loma Prieta Earthquake, liquefaction destroyed the causeway that carried the Moss Beach access road across a tidewater basin, damaged the bridge linking Moss Landing spit to the mainland and cracked the paved road on Paul's Island. Another large earthquake occurrence is likely to cause liquefaction in this area.

Q.5.6 FLOODING

All Harbor facilities are at risk due to flooding as the Harbor is surrounded by water- the ocean, Elkhorn Slough, Moro Cojo Slough, and the nearby Salinas River. This risk is likely to increase with sea level rise.

Q.5.7 HAZARDOUS MATERIALS INCIDENT

Highway 1 and a number of industrial and commercial facilities are in close proximity to the Harbor. Oil spills in the Harbor is another large concern. The largest impact of a hazardous materials incident would be the effect on water quality, as well as people and residents in the Harbor. A hazardous materials incident could contaminate sediment, which would complicate dredging operations since contaminated sediment is very difficult to dispose of.

Q.5.8 HUMAN CAUSED HAZARDS

It is often quite difficult to quantify the potential losses from human-caused hazards. While facilities themselves have a tangible dollar value, the impact to identified values will vary from event to event and depend on the type, location, and nature of a specific incident. The Harbor is unlikely to be a major target for terrorism or targeted violence, but it is a possibility.

Q.5.9 PUBLIC HEALTH HAZARDS

Based on the experience of the COVID-19 pandemic, it is noted that pandemic or epidemic could impact parking and tourism revenue, as well as effect businesses which operate out of the Harbor.

Q.5.10 SEVERE WEATHER

All severe weather events profiled in this Plan have the potential to affect the District's facilities and infrastructure, but severe winter storms are the weather hazard of highest concern. Severe winter storms have the potential to create numerous flooding issues. Winter storms can cause riverbanks to fail and erode coastal dunes, which leads to more sedimentation in the Harbor. This then requires more frequent dredging of the Harbor and the need for bank stabilization projects. Flooding risks during winter storm events is predicted to increase significantly due to climate change and sea level rise. Data from the Sea-Level Rise Assessment for Moss Landing Harbor (CCWG, June 2019) indicates that by 2030, winter storms could lead to flooding of the parking areas of South and North Harbor and limit access to the Moss Landing island during storms.

Q.5.11 SLOPE FAILURE

The main impact to Harbor facilities and infrastructure from slope failure would be flood risk. The failure of coastal dunes and nearby riverbanks is likely to exacerbate flood risk in the Harbor.

Q.5.12 TSUNAMI

All Harbor facilities are located in a mapped tsunami inundation zone. The largest impact of a tsunami would be the destruction of dock structures, but a large enough tsunami could have catastrophic impacts on the Harbor.

Q.5.13 UTILITY INTERRUPTION

All critical facilities and infrastructure that is operated by electricity is exposed and vulnerable to utility interruption. Much of Harbor's facilities are reliant on electricity to function. The main concern of an extended utility interruption would be the impact to the Harbor's pumps. If boats were to lose battery power, the pumps would be inoperable, and this could cause boats to sink.

Q.5.14 WILDFIRE

Wildfire does not pose a major threat to the Harbor District.

Q.5.15 CLIMATE CHANGE AND SEA LEVEL RISE

The effects of climate change are varied and include warmer and more varied weather patterns and temperature changes. Climate change will exacerbate the risk posed by many of the hazards previously profiled in this Plan and have a measurable impact on the occurrence and severity of natural hazards. Sea level rise is likely to impact all Harbor facilities and infrastructure. Determination of assets at risk was based on analysis completed for the AB 691 Sea-Level Rise Assessment for Moss Landing Harbor.³

By 2030, flooding is projected to effect portions of the main parking lot, Docks A and B, the small boat launch ramp, and the parking area of North Harbor. If the Moss Landing tide gates fail to restrict high tides, access to some of the harbor infrastructure will be compromised. The greatest tidal flooding impacts will occur during high tides (king tides) during storms that increase wave energy, local ocean levels, and increased river discharge. River discharge during winter storms is predicted to increase. These increases in river flows are predicted to cause localized flooding as stormwater from the watershed meets higher winter ocean elevations in the harbor. Greater velocity discharge from the Old Salinas River into the Harbor is likely and may impact infrastructure in its path. Greater sedimentation of the Harbor due to greater erosion in the watershed is likely.

By 2060, flooding will occur monthly or daily in low-lying areas throughout the Harbor and storm and tidal flooding are predicted to compromise large portions of Harbor infrastructure. Flooding is projected to be extensive within parking areas, dock access ways, launch ramps, and access roads. Flooding of portions of Moss Landing and Sandholdt roads are predicted and will limit access to the Harbor. This would significantly reduce the use of the Harbor and could pose a serious public safety challenge by restricting emergency service vehicles and staff. The Harbor mouth jetty is likely to be overtopped by winter waves, compromising the navigability of the Harbor. Over half of the land in the North Harbor is predicted to be flooded and access to much of the Harbor District's State granted lands will be restricted during high tides. Wave overtopping of the dunes is possible, which would lead to ocean waves and sand draining into Moss Landing Harbor. Combined with loss of the tidal marshes of

³ [AB 691 Sea-Level Rise Assessment for Moss Landing Harbor](#), Central Coast Wetlands Group (June 2019)

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Elkhorn Slough, sedimentation within the Harbor will greatly increase. River discharge during winter storms is also predicted to increase. Increases in river flows are predicted to cause localized stormwater flooding as from the watershed meets higher winter ocean elevations. Sedimentation of the harbor is also likely to increase due to increased erosion within the watershed during high flow events. Increased discharge velocity under Sandholdt Bridge may impact vessels and Harbor infrastructure in south harbor.

By 2100, access to all Harbor infrastructure will be restricted/flooded during daily high tides. Winter storm waves and coastal erosion will likely bisect the sand spit above and below the Sandholdt Bridge, leading to limited use of the granted lands as a safe harbor marina. *Table Q-2* summarizes the Harbor facilities and infrastructure identified by the Sea-Level Rise Assessment for Moss Landing Harbor⁴ as vulnerable to various sea level hazards during future time horizons.

Table Q-2

Moss Landing Harbor District Facilities and Infrastructure Vulnerable to Sea Level Rise Hazards

Structure	Coastal Erosion			Storm Flooding			Tidal Flooding			Fluvial Flooding		
	2030	2060	2100	2030	2060	2100	2030	2060	2100	2030	2060	2100
Harbor Office						1			1			1
Restroom & Laundry Facilities						3			3			2
Maintenance Shop						1			1			1
Cannery Building					1	1			1		1	1
ML Storage Buildings						2			2			2
Sea Harvest Building					1	1			1			
North Harbor Building						1			1			
Old Pot Stop Building						1			1			
MB Kayak Building					1	1			1			
Used Oil Containment Facility					1	1			1		1	1
Trash Enclosures				1	2	2		1	2	1	1	2
Launch Ramps				2	2	2	2	2	2			
Sewer Lift Stations						2			1			1
Dry Storage					1	1		1	1		1	1
Maintenance Yard						1			1			1
Unimproved Lots				1	1	2		1	2		1	1
Moss Landing Community Park						1			1			1
Pier				1	1	1	1	1	1			
Storm Drains	0	0	0	7	12	16	2	7	15	2	8	8
Docks	0	0	1	12	13	13	12	13	13	10	10	11
Electric Meters	0	0	2	3	6	7	1	5	7	2	5	6

⁴ [AB 691 Sea-Level Rise Assessment for Moss Landing Harbor](#), Central Coast Wetlands Group (June 2019)

Q.6 CAPABILITY ASSESSMENT

The Moss Landing Harbor District performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment:

- An assessment of planning and regulatory capabilities is presented in *Table Q-3*
- An assessment of administrative and technical capabilities is presented in *Table Q-4*
- An assessment of fiscal capabilities is presented in *Table Q-5*
- An assessment of education and outreach capabilities is presented in *Table Q-6*
- An overall self-assessment of capability is presented in Section Q.6.1 in *Table Q-7*

Table Q-3
Planning and Regulatory Capability

Document, Program, Requirement		Department	Comments
General Management Plan	☒	• Admin	Ordinance Code is basis of operations
Capital Improvement Plan	☒	• Admin	Capital projects included in the budget and new long range planning efforts are underway
Stormwater Management Plan	☒	• Admin	
Coastal Management Plan	☒	• Admin	
Climate Action/ Adaptation Plan	☒		AB 691 Sea-Level Rise Assessment for Moss Landing Harbor (CCWG, 2019)
Emergency Operations Plan	☒	• Admin	Business Response Plan
Specific Emergency Response Plans	☒	• Admin	Tsunami Harbor Maritime Playbook, Coastal Incident Response Plan, Business Response Plan
Continuity of Operations Plan	☒	• Admin	In Business Response Plan
Evacuation Plan	☒	• Admin	In Business Response Plan
Illness and Injury Prevention Plan	☒	• Admin	In Business Response Plan
Business Response Plan	☒	• Admin	
Hazardous Materials Plan	☒	• Admin	Spill Prevention Plan
Other:		• Dredge Materials Management Plan	

Table Q-4
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with knowledge of land development and land management practices	☒	• Admin	Use consultants as needed
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	☒	• Admin	Use consultants as needed

Table Q-4
Administrative and Technical Capability

Staff/Personnel Resources		Department	Comments
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	☒	• Admin	Use consultants as needed
Building Inspector	☒	• Admin	Use consultants as needed
Emergency Manager	☒	• Admin	General Manager/ Harbormaster
Resource development staff or grant writers	☒	• Admin • Operations	
Public Information Officer	☒	• Admin	General Manager/ Harbormaster
Scientist(s) familiar with the hazards of the community	☒	• Admin	Use consultants as needed
Staff with education or expertise to assess the community's vulnerability to hazards	☒	• Admin	Use consultants as needed
Personnel skilled in Geographic Information Systems (GIS)	☒	• Admin	Use consultants as needed
Maintenance programs to reduce risk	☒	• Admin • Operations	Dredge Materials Management Plan, In-house maintenance Program
Warning systems/services	☒	• Admin • MoCo OES	PA System, OES Reverse 911

Table Q-5
Fiscal Capability

Fiscal Resources		Department	Comments
General Funds	☒	• Admin	
Capital Improvements Project Funding	☒	• Admin	General and trust lands accounts
Special Purpose Taxes	☐		
Stormwater Utility Fees	☐		
Gas / Electric Utility Fees	☐		
Water / Sewer Fees	☐		
Development Impact Fees	☐		
General Obligation Bonds	☐		
Special Tax and Revenue Bonds	☐		
Other:		• Berth Rental and Parking Fees • Permit Fees • Services and Equipment Fees • Lease Agreements	

Table Q-6
Education and Outreach Capability

Educational and Outreach Resources	Department	Comments
Local citizen or non-profit groups focused on environmental protection, emergency preparedness, etc.	☐	
Ongoing public education or information program	☒ • Admin	The District shares public information on their website
Natural disaster or safety related school programs	☐	
Public-private partnership initiatives addressing disaster-related issues	☐	

Political Capability

The Moss Landing Harbor District Board is non-partisan and supports reducing risk to Harbor facilities and infrastructure.

Q.6.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The Moss Landing Harbor District is a Special District and is therefore not eligible for flood insurance under the National Flood Insurance Program (NFIP).

Q.6.2 SELF-ASSESSMENT OF CAPABILITY

Table Q-7
Self-Assessment of Capability

Capability	Degree of Capability
Planning and Regulatory Capability	Moderate
Administrative and Technical Capability	Moderate
Fiscal Capability	Limited
Education and Outreach Capability	Limited
Political Capability	Moderate
Overall Capability	Moderate

Q.6.3 OPPORTUNITIES TO EXPAND/ IMPROVE MITIGATION CAPABILITIES

Planning, regulatory, fiscal, administrative, technical, education, and outreach capabilities can all be expanded or improved using a combination of the following strategies:

- Increase capacity through staffing
- Training, and enhanced coordination among all department and jurisdictions
- Emergency management/hazard specific program enhancements, training, and exercising
- Increased funding opportunities and capacity
- Implementation of mitigation actions and projects

- Continuous research on grant opportunities for emergency management, hazard mitigation, and infrastructure and community development.

Capabilities and abilities to expand or improve existing policies and programs will be re-evaluated during the next Hazard Mitigation Plan update and annual plan review meetings.

Q.6.4 INTEGRATION WITH OTHER PLANNING INITIATIVES

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital improvement planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation. This section identifies where such integration is already in place, and where there are opportunities for further integration in the future.

Existing Integration

Moss Landing Harbor District was not previously a part of the Monterey County Multi-Jurisdictional Hazard Mitigation Plan.

Opportunities for Future Integration

As this hazard mitigation plan is implemented, Moss Landing Harbor District will use information from the plan as the best available science and data on natural hazards. The capability assessment presented in this annex identifies codes, plans and programs that provide opportunities for integration. The area-wide and local action plans developed for this hazard mitigation plan include actions related to plan integration, and progress on these actions will be reported through the progress reporting process described in **Volume 1**. New opportunities for integration also will be identified as part of the annual progress report. The plans and programs listed in the Capability Assessment cover the majority of District operations where the hazard mitigation goals are addressed. However, the capability assessment identified the opportunity for future integration of recommendations of the hazard mitigation plan for all the plans and programs listed as they are updated periodically.

Q.7 PROBLEM STATEMENTS

Problem Statements are statements of particular interest regarding primary hazards of concern, geographic areas of concern, or vulnerable community assets. As part of the planning process, the Districts' Planning Committee identified key vulnerabilities and hazards of concern. The Hazard Problem Statements were primarily derived from Moss Landing Harbor District's Hazard Mitigation Planning Committee and informed by review of existing literature about Moss Landing Harbor District's assets and analysis using best available data relating to the vulnerability analysis for each piece of Moss Landing Harbor District's critical infrastructure. They were developed to assist in the identification and analysis of potential hazard mitigation actions for Moss Landing Harbor District.

Hazard Problem Statements helped the Planning Committee identify common issues and weaknesses, determine appropriate mitigation strategies, and understand the realm of resources needed for mitigation. Hazard Problem Statements for the District are identified below:

- Sea level rise has the potential to have catastrophic effects on the Moss Landing Harbor District and is likely to reduce access to many Harbor facilities during large storm events.
- Coastal erosion combined with winter storm events and sea level rise is likely to have major impacts on the Harbor. By 2060, coastal erosion of the sandspit that protects Moss Landing Harbor from ocean waves is predicted to be significant and this could jeopardize the Harbor unless protective actions are taken. By 2100, Winter storm waves and coastal erosion will likely bisect the sand spit above and below the Sandholdt Bridge, leading to limited use of the granted lands as a safe harbor marina.
- A number of hazards in this Plan have the potential to significantly complicate dredging operation. Winter storms can cause riverbanks to fail and erode coastal dunes, which leads to more sedimentation in the Harbor. This then requires more frequent dredging of the Harbor. Hazardous materials incidents can contaminate sediment, which can complicate dredging operations since contaminated sediment is very difficult to dispose of.
- Tsunami, flooding, and severe storms can create strong and unpredictable currents, sudden water-level fluctuations, amplified waves, along with a range of other secondary hazards all of which can severely impact docks, dock structures (piles, pile guides, moorings, cleats), and vessels.
- Various County, State, and Federal agencies have jurisdiction over lands surrounding the Harbor District. This complicates mitigation activities to address many of the hazards discussed in this Plan since the effectiveness of the Harbor's actions depends on the actions of other agencies.

Q.8 MITIGATION GOALS, STRATEGIES, AND ACTIONS

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

The District's Planning Team used the same mitigation action prioritization method as described in *Mitigation Strategy* in **Volume 1**, which included a benefit-cost analysis and consideration of mitigation alternatives. Based upon the risk assessment results and the District's planning committee priorities, a list of mitigation actions was developed. The Hazard Mitigation Action Plan Matrix, in *Table Q-8* lists each priority mitigation action, identifies time frame, the responsible party, potential funding sources, and prioritization, which meet the requirements of FEMA and DMA 2000.

Status of Previous Plan Actions

Moss Landing Harbor District was not previously a part of the Monterey County Multi-Jurisdictional Hazard Mitigation Plan.

Table Q-8
Moss Landing Harbor District Hazard Mitigation Action Plan Matrix

Action #	Status/ Timeframe	Applicable Hazard(s)	Description	Ranking / Prioritization	Administering Department	Potential Funding
1	Ongoing	Flooding, Tsunami, Severe Winter Storms, Coastal Erosion, Earthquake	Update dock structures and old dock infrastructure in order to reduce flood risks. Continue to improve dock infrastructure by moving away from wooden piles and docks and use more concrete.	High	Admin	General and Trust Lands Funds, Grants, Emergency Funding
2	Ongoing	Flooding, Coastal Erosion, Severe Winter Storms, Sea Level Rise	Armor parking lots, riverbanks, other vulnerable infrastructure in order to reduce flood and sea level rise risk and continue to implement erosion control measures.	High	Admin	General and Trust Lands Funds, Grants, Emergency Funding
3	Long-term	Sea Level Rise	Consider opportunities to raise infrastructure to address long-term sea level rise risks.	Moderate	Admin	General and Trust Lands Funds, Grants, Emergency Funding
4	Ongoing/ As Needed	Flooding, Severe Winter Storms	Continue dredging operations as needed and as storms continue to get worse due to climate change continue to monitor the frequency of dredging.	High	Admin	General and Trust Lands Funds, Grants, Emergency Funding

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